BEFORE THE STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
CALIFORNIA ENERGY COMMISSION (CEC)

In the Matter of:	)	
	)	Docket No. 10-IEP-1E
Preparation of the 2010 Integrated	)	& 10-IEP-1F
Energy Policy Report Update	)	

Joint Committee Workshop on ARRA-Funded Clean Technology Innovation in California

CALIFORNIA ENERGY COMMISSION
HEARING ROOM B
1516 NINTH STREET
SACRAMENTO, CALIFORNIA

TUESDAY, JULY 13, 2010
10:00 A.M.

Reported by:
Peter Petty

Commissioners (and their advisors) Present (WebEx)

Karen Douglas, Chairman and Presiding Member, IEPR Committee, Federal Stimulus Program (Ad Hoc) Committee

Jeffrey Byron, Commissioner and Associate Member, IEPR Committee

Anthony Eggert, Associate Member, Federal Stimulus Program (Ad Hoc) Committee

Lorraine White, Advisor to Commissioner Eggert

Staff Present:

Suzanne Korosec, IEPR Lead
Pat Perez
Pedro Gomez
Mike Gravely
Jennifer Allen

Also Present

Presenters

Pat Perez, Deputy Director, Fuels and Transportation Division (CEC)
Pedro Gomez, Program Manager, Energy Technology Systems Integration Program (CEC)
Jim Parks, Sacramento Municipal Utility District (SMUD)
Jeffrey Nichols, San Diego Gas & Electric Co. (SDG&E)/ Sempra Energy
Marco Di Paolo, Los Angeles Department of Water and Power (LADWP)
Percy Haralson, Southern California Edison Company (SCE)
Tammie Candelario, Primus Power Corporation
Jennifer Allen, Fuels and Transportation Division (CEC)
Ray Hobbs, ETEC/Nissan
Matt Miyasato, South Coast Air Quality Management District (SCAQMD)/Port of LA and LB
Richard Lowenthal, Coulomb Technologies
Michael Sinkula, Envia
Michelle Kirkhoff, San Bernardino Area Governments (SANBAG)

Public

J.P. Sweeney, Central Transit & Development Corp.
Doug Krieger, CALGreen at Work
Craig Horne, EnerVault

I N D E X

P R O C E E D I N G S

JULY 13, 2010 10:20 A.M.

MS. KOROSEC: All right, we are going to go ahead and get started here. Thank you, Jim, for your patience while we are dealing with some of the technical difficulties; this room has only recently been configured to have all this audiovisual equipment, so we are still working out some of the bugs. Good morning. I am Suzanne Korosec. I manage the Energy Commission's Integrated Energy Policy Report Unit. Welcome to today's workshop on ARRA-Funded Clean Technology Innovation in California. This workshop is being held jointly by the Energy Commission's Federal Stimulus Program (Ad Hoc) Committee and the Integrated Energy Policy Report Committee.

Just a few housekeeping items before we get started. Restrooms are in the atrium through the glass doors and to your right. There is a snack room on the second floor of the Atrium at the top of the stairs under the white awning, and if there is an emergency and we need to evacuate the building, please follow the staff outside to the park that is kitty corner to the building, and wait there until we are told that it is safe to return.

Again, I apologize for the last minute change in rooms, this meeting was originally scheduled for Hearing Room A across the way, but a siting hearing there is going

an extra day, so we were booted over into this room, so we will make the best of it today.

Today's workshop is being broadcast through our WebEx conferencing system, and parties should be aware that the workshop is being recorded. We will make the recording available on our website within a couple of days of the workshop and we will also make a written transcript available without about two weeks of the workshop.

We have a number of presentations today and will have opportunity for Q&A after each presentation and we will also have an opportunity for more general public comment at the end of the day. At that point, we will take comments first from parties who are here in the room, and then we will turn to the folks on WebEx. For those of you who are here in the room, we would like you to come up to the center podium to ask questions or to make comments so that we can your comments on the transcript through the microphone there. And it is also helpful if you can give our transcriber a business card so that we can make sure that your name and affiliation are correct in the transcript.

For those of you joining us through WebEx, you can use the chat function at any time to let the WebEx Coordinator know that you would like to ask a question or make a comment, and we will open the line at the appropriate time. WebEx speakers will need to speak loudly to be heard

since this new system does not amplify our callers as much as we would prefer. We are also accepting written comments until the close of business on July 23rd, and the notice for today's workshop, which is on the table out in the atrium and also available on our website, explains the process for submitting those written comments.

Today's workshop is the third of six public workshops that we are holding as part of the 2010 Integrated Energy Policy Report Update, or IEPR Proceeding. The first workshop covered transparency and accountability, and the use of ARRA funds for energy projects in California; the second highlighted the efforts of local, regional and state government energy efficiency retrofits that are being funded by ARRA. Next week, we will be holding two workshops, the first talking about the various clean energy work force and training activities that are underway throughout California -- pardon me, I am adjusting my mic, I am told that they cannot hear us on the WebEx – and the second workshop will cover the Energy Commission's Clean Energy Manufacturing Program, which is providing financial support to businesses, technology developers, and vehicle fleet owners, to encourage the production of clean energy technologies and fuels. Finally, on July 29th, we will look at how ARRA funding is helping to increase the energy efficiency of existing buildings, consistent with the State policy of

achieving all cost-effective energy efficiency, and how those efforts can be a foundation for additional efforts in the future. More information about each of these workshops is available on our website with the workshop notices, and we will also be posting the agendas two days before each workshop.

Just some quick background on the IEPR, itself. The Energy Commission is required in statute to produce an IEPR every two years, in odd numbered years, that takes a look at California's energy markets, including expected energy supplies and demand, energy production, delivery, distribution, market trends, and the major energy policies that are facing the State. We also prepare an update to the IEPR in the intervening years, that provides a progress report on IEPR topics and identifies any new developments or issues may have arisen.

This year, with the large influx of Recovery Act funding into California, the IEPR Committee has decided to focus the 2010 IEPR update on examining the impacts of that funding, the benefits, the challenges, and the energy policy implications of this large investment of Stimulus funding into California's energy sectors, and how these funds are going to help us achieve our long term and environmental goals.

Today's workshop is focusing on how the Energy

Commission is using its existing program funds to leverage federal ARRA funds and bring more of those dollars to California to stimulate our economy and to grow our Clean Tech sector. We are providing cost share funding through both our Public Interest Energy Research Program and our Alternative and Renewable Fuel and Vehicle Technology Program. Our agenda today will start with an overview of the energy-related ARRA funds that are coming to California, followed by presentations on the PIER Program and its contribution to leveraging ARRA funds, and we will hear first from Energy Commission staff with an overview of both the PIER Program, followed by presentations from individual projects who are receiving cost share funding from PIER. Now, in the afternoon, we will hear about the Alternative and Renewable Fuel and Vehicle Technology Program cost share efforts, again, starting with the presentation by the Energy Commission staff, followed by presentations from cost share recipients. And then, we will finish up at the end of the day with an opportunity for public comment. So, with that, I will turn it over to the Commissioners for opening comments.

CHAIRMAN DOUGLAS: Good morning everybody. I am Chairman Douglas, Chair of the Energy Commission and Presiding Member of the ARRA Committee. I am joined on my immediate right by Commissioner Byron, the Presiding Member

of the R&D Committee and, to his right, Commissioner Eggert, the Associate Member of the Transportation Committee. To Commissioner Eggert's right is Lorraine White, Commissioner Eggert's Advisor.

I would like to kick this off by welcoming everybody to the Energy Commission for this IEPR Workshop. We are tremendously interested in what the speakers and the members of the public have to bring to our attention today. Most of the attention, I would say, of the outside world on the Energy Commission's work on the Recovery Act has focused on the funds that we are administering directly. However, we have been putting a tremendous amount of effort and attention into not only the funds that we have administered directly, but also the competitive funding that the Department of Energy has made available, competitively, and that the State of California, because of the tremendous depth of talent in the Clean Energy area, in our public sector, private sector, and certainly in the universities throughout the state, that California has great potential to go after and to bring back to California to the benefit of the state. For that reason, we have put a significant amount of the State Research funds forward as potential match funding in order to strengthen applications of California Applicants in areas where we felt the state has a strong competitive opportunity to bring funding back to

California, and where the Federal solicitations were in line with and furthered State objectives. Part of what we are here today to do is to hear about how that strategy has worked, what benefits have been brought to California, and what more remains to be done.

I am very pleased, again, to welcome you, and I would like to ask my fellow Commissioners if they would like to make some opening statements.

COMMISSIONER BYRON: Thank you, Madam Chair, good morning. Jeff Byron, and I would like to just say a couple of things. You know, probably you all read the same things I do in the newspaper, Government is not necessarily known for creating jobs; in fact, there are a lot of folks who kind of figure that, in the long run, since the primary source of revenue for Government is taxation, that it actually reduces jobs. And there are many who believe that the Stimulus package is not working, those folks are getting plenty of voice, and that we may not really know for another two or three years if, indeed, the Stimulus package that we are working with here today is going to be effective. But let me just mention a few things. I am not an Economist, I am not an Ideologue, and we will know in a few years, indeed, whether or not this is all going to work. But today, what we are really interested in is making sure that we maximize what we have, what we are working with, and what

we have been given. There is an enormous pool of funds available and California has been endeavoring to get as much of that into the state as we can and to apply it effectively. These are not just any funds, these are earmarked by the Department of Energy to save consumers money while creating jobs. And the most important point I want to make is that we are accelerating programs and policies in California that we already know work. We are accelerating research programs and demonstration projects that have proven to save consumers money and create new technologies. I was reminded about a report that just came out last month by the American Innovation Council, which is a small group of some of the United States' more successful CEOs, in any case, that tries to make the case that the Department of Energy, the Government needs to spend at least $15 billion a year on energy research, and this is coming from the private sector, this is coming from the venture capitalists. We are doing that to some extent with these funds here today. So, I am very interested in learning how the Public Interest Energy Research and the Alternative and Renewable Fuel and Vehicle Technology Program funds have been used to leverage these American Recovery and Reinvestment Act Funds in the state, to hear from the participants and the recipients of those funds. I want to hear the good news, but I also want to hear what we could do

better, and what we may have done wrong. Commissioner Eggert.

COMMISSIONER EGGERT: Thank you, Commissioner, and thank you, Madam Chair. It is a great pleasure to be here today. I am looking forward an informational packed workshop to discuss these issues. I wanted also to just make a couple of quick points before going into the meat of this. I think we do have some good news in California. Clean energy and energy efficiency technology as industries are kind of one of the shining lights of our struggling economy here in the state, it is one of the few areas that is actually adding jobs and attracting new companies and new measures into the state. And we are, as a state, seeing some of the most significant private capital, including venture capital, coming in to support these clean energy technologies. And I just wanted to pick up on a theme; you had mentioned the fact that, you know, government is not always known, necessarily, for being the most effective job creator, and I think we do have to kind of recognize our role and our ability to influence these markets. It really does rely on our ability to form effective partnerships, not just with federal government, regional, and local governments, which we will hear about a lot today, but also, of course, the private industry and the private investors, because our success will be based on our ability to leverage

all of those resources to create successful commercial enterprises, and transform these industries into sort of the new energy economy that I think is going to help drive our state economy. You are seeing a lot of really great examples of the technologies that we have been supporting through the PIER Program, the R&D Program now being brought into the marketplace, and I think that is really exciting to see some of those incubations actually bearing fruit. I think, also, just to get a sense of the scale of some of these markets, we will be hearing a lot about the AB 118 program that supports our investments in clean vehicle technologies and low carbon fuels, that is about $100 million a year, which sounds like a lot, but when you compare it to what we spend on fuel on a daily basis, we spend over $150 million per day on gasoline and diesel fuel just in California. So, again, our ability to transform that marketplace is really going to be dependent upon our ability to make very strategic and leveraged investments in that space, and I look forward to hearing more of that today.

Finally, I would just like to say that, as a general rule, I am very interested in hearing, including from some of the folks that will be presenting from the private sector, is how do we facilitate this transition as we are moving from these state funded programs, you know, are the

investments that we are making the most strategic, are they done in such a way that they fill the gaps, that are not filled by the private sector, and how do we transition to that sustainable commercial market? So, with that, I will turn it back over to Suzanne and look forward to the discussion.

MS. KOROSEC: We will go ahead and we will start with our first speaker, who is Pat Perez, who will be talking about the Economic Recovery Program here at the Commission.

MR. PEREZ: All right, good morning, Commissioners and Advisors, and welcome to those listening in today. Today, I would like to talk a little bit about the American Recovery and Reinvestment Act Competitive Funding Programs, and talk about the broad range of clean energy projects that will, over the next few years, bring us long term benefits. I would also like to acknowledge up front that the Energy Commission has been actively involved in going after these competitive solicitations, working with many of our partners, whether they be utilities, local government, and the private sector. And there have been literally over 100 U.S. Department of Energy solicitations, of which the Energy Commission has been tracking and reporting on. And Vanessa Kritwell, in the very back corner of the room, has been instrumental in keeping track of the many many multiple

solicitations and awards that we have been following and pursuing, so I want to acknowledge her for the tremendous work that she has done, as well as the entire Recovery Act team here at the Energy Commission.

Today, what I would like to do is cover four items: give you a general overview of the DOE funding opportunities, also share with you the energy money that is coming in from these competitive awards to California, highlight for you a few of the larger competitive and noteworthy awards, and then, finally, close on the world of leveraging and cost sharing with respect to ARRA.

Certainly, it has been an exciting time here at the Energy Commission and throughout California with the Recovery Act, and it is all about creating a cleaner energy supply future for all of us. This figure displays what Congress allocated through the U.S. Department of Energy for a variety of energy programs. This is over $30 billion, which represents, from my perspective, a significant down payment on the country's both energy and environmental future. This money, of course, is targeted for businesses, universities, national labs, non-profits, state and local government, and Indian tribes, so this essentially gives you a graphic depiction of where the allocations were made.

This slide provides you with some examples of the many competitive solicitations that DOE conducted, as well

as the funding awards that were provided in the over 100 solicitations that were conducted over the past year and a half. Many of these programs that are outlined here on this slide contained multiple funding solicitations, but this just gives you a sampling of some of the areas with respect to energy efficiency, renewable energy, upgrades to the electrical grid, transportation energy programs, carbon capture and storage, as well as science and innovation, an area that I will be speaking about here in a few minutes where California did very well in terms of competing.

Governor Schwarzenegger, early on responded to the Recovery Act by directing state agencies and departments to go after these competitive solicitations in an aggressive manner, so that we could capture a significant share of what was available from the American Recovery Act. This table here is a combination of what I call a formula grant and competitive funding awards that have been made to date, as of a couple weeks ago. Just within California, alone, $2.3 billion has been awarded to the State, and that represents roughly 501 projects in California. And then, if you look at the tax credits and other grants that came out of the Recovery Act, there is another 257 projects that will benefit from this federal funding over the next couple of years. The section that is in green there reflects the split from the previous pie chart; as you can see, roughly

of the money coming to California, a lion's share has been in the energy efficiency and renewable energy programs, that is roughly half of the money that California has received has been in that area. Overall, California has received about 8 percent of the national share, so we would have liked to have done better, but because of other competing needs throughout the country, in some areas we did much better than others. Because of California's incredible academic institutions and national laboratories out here in California that have focused on Science, you can see that we have done very well when it comes to Science, as well as the fossil energy, which is carbon capture and sequestration, and as well as advanced research projects.

CHAIRMAN DOUGLAS: Pat, quick question on that.

MR. PEREZ: Yes.

CHAIRMAN DOUGLAS: Does that 8 percent also include funds such as, for example, nuclear funding, which we got none of because we really have very little that would have been applicable, correct?

MR. PEREZ: That is accurate. One of the reasons why we did so poorly there is much of the – the eastern part of the country where a lot of the nuclear waste disposal issues have arisen over the last five or 10 years, that is where the federal government decided to focus the clean-up efforts, on those projects that have the greatest need. And

that is why we did so poorly in that category.

COMMISSIONER EGGERT: One other clarification. I think it is in a later slide, you talked about an additional $22 million of ARPA projects in Slide A, is that not reflected in this first lighting category? These were just announced within the last –

MR. PEREZ: Yes, these were added. Slide A is updated to reflect yesterday's announcement. This slide has not been updated to reflect yesterday's announcement. So, again, here is the breakdown as of mid-June in terms of the funding that is coming to California, so you can see a significant share, again, is in the energy efficiency and renewable energy front, and also electricity delivery and energy reliability is also a significant component. Again, most of the money that is captured and reflected in this pie chart is a result of competitive solicitations, and really designed – this funding, anyway – is designed to fund initiatives that will provide longer term benefits.

COMMISSIONER BYRON: Pat, sorry for the interruption, does the Smart Grid funding appear in the electricity delivery?

MR. PEREZ: Yes, it does.

COMMISSIONER BYRON: Okay, thank you.

MR. PEREZ: What I thought I would do for the next couple minutes is just highlight some key large projects in

California where we have received awards from DOE, including BrightSource Energy, a $1.4 billion loan guarantee, which will support construction of a large utility scale concentrated solar power plant down in the Mojave Desert, as well as the attention that Tesla Motors has been getting for their $465 million loan for the manufacturing facility in Fremont, and then also Sacramento Municipal Utility District, who is here today, will be talking a little bit more about the details of their awards, which is the $127.5 million Smart Grid system that we are all very excited about, and certainly through the Energy Commission's Public Interest Energy Research Program, we are going to be providing about $1 million in cost share, pending finalization of the DOE grant agreement. So, you will be hearing more about the specifics of these projects, as well as the AB 118 projects from other speakers.

COMMISSIONER BYRON: Mr. Perez, are you excited about the SMUD project because you live here in Sacramento?

MR. PEREZ: I do not want to pose any conflicts of interest, but certainly, yeah, that is very exciting, is being one of SMUD's customers. A couple other exciting projects in California is the hydrogen energy project down in Bakersfield, it is a $308 million project, and then also a number of small businesses throughout California were awarded additional funding for innovation research

development and deployment of clean energy technologies with respect to renewable energy. There are also 11 other California entities who were awarded $22 million in the advanced research projects, agencies solicitation – many of you may have seen those awards posted yesterday by DOE – and we did extremely well in that solicitation, nearly a quarter of the total awards came to California, and I think that speaks volumes about the cooperative relationships and partnerships that were developed for these competitive solicitations, which benefitted from input from academic institutions, the private sector, and government, as they brought their various expertise together to develop very strong applications that provided cost share funds that helped us achieve these awards. And, again, you will be hearing more about these awards following my presentation and later this afternoon.

I also wanted to call to your attention one example of the Energy Commission using the State Energy Program formula grant to develop an innovative, competitive program to support the private sector. This is also known as the Clean Energy Business Financing Program that we are very excited about, specifically targeted for the private sector, encouraging the production and manufacture of energy efficiency components, as well as renewable energy. We will be posting proposed awards later this week, and we are very

excited about that. And following the posting of the awards, and further discussion, hopefully we will be approving the loan awards sometime in August, so that we can get these manufacturing facilities running quickly to provide much needed jobs.

Finally, as I mentioned, the value and the importance of pulling resources across multiple communities, government, the private sector, and other entities has been critical and crucial for attracting and securing these federal awards from DOE. The leveraging of these funding sources allows us to cover more projects in the state, but also provide greater benefits because we are tapping into different expertise and strengths of different government and private sector entities. The Energy Commission is leveraging more than $800 million in federal and other public-private sector funding through these awards, and I will say, the other thing that the Commissioners have done, as well as the Governor, that has been in my mind very effective is providing support letters for entities that are competing in these competitive solicitations. The Energy Commission, alone, provided over 120 letters of support in these applications that went to DOE, as well as providing much needed critical cost share funding to strengthen the proposals because one of the things that was contained in many of these solicitations were matching share requirements

of either 20-50 percent, just to apply for this funding, so it was instrumental and very effective in securing support. The other benefit that came out of this whole Recovery Act and our ability to work with others is it forced government, as well as the private sector and others out of their particular silos because, in putting together these applications, we had to work together and learn from others' expertise. I think one of the tremendous untold stories of the Recovery Act is that we have new partnerships that have been formed, and parties working together that had never worked together in the past with respect to governments in Northern California, working with Southern California, the private sector working with regional entities in the San Joaquin Valley, that would have never existed without these funding opportunities. And certainly the Energy Commission's work with the Employment Development Department and other entities that are managing the Clean Energy Work Force Training Funds have forged long term partnerships that I think will be around for many many years, and hopefully decades.

The next table provides the cost share awards that the Energy Commission is providing under the Alternative Renewable Fuel and Vehicle Technology Program, also referred to as AB 118, and this just provides you a nice cross section of the $36.5 million that the Energy Commission is

providing to various utilities and private companies and local governments to leverage and bring more funding to California for a variety of transportation energy-related programs and projects. You are going to be hearing details on each one of these projects later today, but these activities will certainly create jobs and position California to play a major role in shaping California's emerging and new energy future, so we are very excited about these opportunities. With that, I think I will close and certainly be pleased to respond to any questions. I do have another commitment over at Business, Transportation, and Housing with the Financial Development Corporations to talk about the Clean Energy Business Financing Program here, in about 45 minutes, so I will stick around if there are any questions.

COMMISSIONER BYRON: Mr. Perez, are you providing this presentation in your new capacity as Director of the Transportation Division? Or in your old capacity of running the ARRA Program here at the Commission?

MR. PEREZ: Well, I thought I was going to escape the ARRA Program in my new capacity, but I have not. The program has followed me. And, certainly, with AB 118 program and the cost share funds, so I guess I am representing my new position as Deputy Director for Fuels and Transportation Division.

COMMISSIONER BYRON: All right. Thanks for being here. A very good presentation.

MS. KOROSEC: Do we have any questions from the audience? Lynette, do we have anything on WebEx? All right.

COMMISSIONER EGGERT: I have a quick follow-up. Just with respect to the breakdown, actually on slide 10, do we have – this looks like the aggregate for the – this is PIER and the AB 118, this is combined? Do we have the breakdown within the public and private to what extent which portion of that is public vs. which portion is private?

MR. PEREZ: We may be able to get that for you, what the breakdown is on that. I do not have it with me. So I can get back to you on that.

CHAIRMAN DOUGLAS: Thank you, Pat. I would also just like to ask, and obviously you will do this, but that we keep the IEPR Docket fully up-to-date as new awards come out, so that when we put out the draft and later finalize the IEPR, we are able to reflect and have in one document for the public to see the most up-to-date status of these awards.

MR. PEREZ: Will do.

COMMISSIONER BYRON: In fact, you just reminded me, Madam Chairman, Pat, maybe you said this, but do we have a sense of how much ARRA funds are still outstanding, that is,

to be awarded?

MR. PEREZ: I believe it is less than six solicitations and it is under $100 million nationally, I believe, and it is my understanding that the Feds will have to announce those awards probably in August. They certainly have to do it before the end of the fiscal year, which is at the end of September, but their goal was to get all the awards out in July, but I have a feeling some of them may spill over into August. But most of the money is gone.

COMMISSIONER BYRON: So you said about $100 million?

MR. PEREZ: Yeah.

COMMISSOINER BYRON: Nationally, and does that include these energy hubs, as well, that I believe are still pending?

MR. PEREZ: I am not sure. I can get you the list of the outstanding solicitations. We have a running table which we can provide to the committee and perhaps provide it to you later this afternoon.

CHAIRMAN DOUGLAS: Good.

COMMSSIONER BYRON: Okay, because there is at least one of those that I think we are very interested in, that is why I asked.

MR. PEREZ: Okay.

COMMISSIONER EGGERT: I think, yeah, there are two, the fuels to sunlight in the buildings hub that we have a

number of proposals, and I believe those are actually funded outside of the ARRA budget, but actually I thought your question was with respect to California's incumbents of the ARRA dollars, and maybe just give a quick update of that, I do not know if it showed up in the presentation here or not.

MR. PEREZ: On which –

COMMISSIONER EGGERT: On the total ARRA received from the state.

CHAIRMAN DOUGLAS: That we are administering?

COMMISSIONER EGGERT: Yeah.

MR. PEREZ: Yeah, I do not have the actual figure. You are referring to the $2.3 billion that has come to California and how much of that is encumbered? Because those are actual awards.

COMMISSIONER EGGERT: Okay, actually, I realized –

MR. PEREZ: Yeah. And I do not have in terms of what has been encumbered by the individual entities for all those competitive awards yet, but that is essentially what has been awarded.

COMMISSIONER BYRON: Right.

CHAIRMAN DOUGLAS: So, Pat, I would like to just take this opportunity to thank you and acknowledge you for your work, broadly on ARRA, but also specifically on these competitive programs, because that was a big part of your job description, even though that was not always first and

foremost what we were asked about. I would also like to thank Vanessa back in the corner, for her detailed work in creating and keeping all these charts. And as we go through the day, we will hear from Program staff who also turned their lives upside down to take advantage or help California take advantage of these funds. But we really do appreciate it.

MR. PEREZ: Thank you for the kind comments, Chairman Douglas and Commissioners.

COMMISSIONER BYRON: Pat does not need a microphone.

MS. KOROSEC: Unfortunately, we do for the WebEx, for the folks out in the ether there. All right, next we will be hearing from Pedro Gomez with our PIER Program.

MR. GOMEZ: Good morning, Commissioners, Advisors, folks in the room, and folks online. My name is Pedro Gomez and I am the Program Manager for the Energy Technology Systems Integration Program. I would like to start by giving you a brief overview of PIER and when it started. In 1997, we were established through AB 1890. We are a program that receives $86 million annually. We have over $400 million in active projects currently. Our projects are focused on a strong emphasis on the partnerships. We partner with federal and state agencies, national laboratories, universities, and private researchers. So we say that research powers our future. We fund research to

meet our energy policy goals. Our research projects in one way or another tap into our research goals, in particular, greenhouse gas emission reduction, renewables portfolio standards accomplishments, 32 percent generation coming from renewable sources by 2020, zero net energy Smart Communities, a variety of alternative fuels, in particular, Electric Fuel Vehicles, we look to enable ratepayer participation to reduce their cost, and finally, we focus on creating jobs in the clean energy economy.

So over the last 10 years, PIER has been focused in the Smart Grid area, specifically, long before Smart Grid was coined "Smart Grid." We were doing work in areas of synchrophasors, energy storage, renewable integration, demand response, print security, electric vehicle integration to the grid, and other Smart Grid areas. I wanted to point these out to you because you will see further on in this presentation that much of the work that the Department of Energy has awarded through the ARRA Program focuses in on much of the technology that PIER had a hand in pioneering, specifically synchrophasor measurement, which is a diagnostic tool for the electric grid system. We have a number of storage technologies that we assisted in developing, getting started, and in fact, a couple of those have gone on to get venture capital and actually won awards, so we are grateful that this happened.

Okay, so I have told you about PIER, briefly, and so along comes the American Recovery and Reinvestment Act. And I want to focus specifically on the Smart Grid funding opportunity announcements, which were FOA 36, focused on Smart Grid demonstrations and FOA 58, which was Smart Grid Investment Program. DOE put out $4.5 million to address areas specifically, again, demand response, grid security and storage, renewable integration, distribution automation, synchrophasor deployment, and plug-in hybrid electric vehicles. Again, I want to point back to the previous slide, some of this work that we were doing over the last 10 years is exactly what they are doing now at the national level. This is why we believe California is a leader in Smart Grid, not just development, but deployment.

So, we saw this as a great opportunity to help California-based projects win DOE awards through the Stimulus Program. We wanted to focus in on awarding projects in California that supported California's energy policies, provided ratepayer benefits, developed a clean energy work force, and expanded California's Clean Tech business globally. We put out a solicitation inviting those California-based projects to apply for Energy Commission co-funding. If they met the requirements through the solicitation, we initially would provide them a letter of support that they would include with their application to

the Department of Energy through our communication with the Department of Energy and folks throughout the state, we were led to believe that projects in California that received support from the Energy Commission would enhance and elevate their projects in the eyes of the Federal Government, so we wanted to do that. If those projects went on to win an award from the Department of Energy, we are providing co-funding, indeed, to the tune of about $1 million or 10 percent, whichever is less. Additionally, in some projects, because of our history in doing research and developing projects, we have provided some technical insights and provided some feedbacks to enhance and improve California-based project applications to the DOE.

So you may ask, why did we support ARRA projects? Well, in the previous slide, I gave you some reasons why. But, selfishly, we felt this was a great opportunity to accelerate Smart Grid implementation in California. As an example, PIER spends anywhere from $10-14 million in Smart Grid research annually; we saw this as an opportunity, with federal funds coming into the state, to exponentially move Smart Grid from where we are today, at a much faster rate. So we are looking at modernizing the electric grid, and we wanted to participate in these projects for a variety of reasons, in particular, we wanted to be in these projects from the very beginning through their conclusion, we wanted

to identify what the issues are as they developed and deployed the technology, we want to take those lessons learned, and we want to share them with other California-based projects, along with the general public. We wanted to identify the research gaps as these projects unfold, and then take our regular PIER funding and fund additional research to overcome those challenges. We looked to identify the needs for and help in the coordination of standards development. As an example, the Demand Response Research Center, which is a center that we initiated, started, the work that they have done in opening automated demand response is now being used at the national level to develop national communication protocols and standards. We felt that our projects formed the foundation for California's clean energy economy, and we feel that PIER supported projects will help meet the state's energy and environmental policy objectives.

So, the numbers. PIER put aside about $30-35 million to support California-based projects. To date, we have allocated $22 million, about 24-25 projects. For those $22 million, DOE has awarded or is in the process of awarding almost $400 million to California-based projects. Because these projects are 1:1, so if you apply for a dollar, you needed to show up with a dollar, the third-party contributors to these projects are bringing in almost $785

million, the total Smart Grid projects in California is somewhere near $1.2 billion to date. So, going back to what we normally spend on an annual basis, $10-14 million a year, we are going to see $1.2 billion in Smart Grid over the next two or three years, so you can see why we are excited about the potential of this funding coming into California. With that said, I would like to open it up to any questions you may have.

COMMISSIONER BYRON: Really more a comment, Mr. Gomez.

MR. GOMEZ: Yes, sir.

COMMISSIONER BYRON: You know, chairing R&D and having the opportunity to chair the Transmission Research Advisory Committee with you and Mike Gravely, I have had opportunity to see all of these activities up close, and I am very interested in hearing from the participants in these projects, but I think really more, just a comment, for the public present and my fellow Commissioners, who probably know all this stuff already, but these ARRA funds when they came in, when we first heard about them, were really unplanned and new. We really did not know how we were going to deal with these – they were competitive, the amounts were unknown, and, of course, we wanted to maximize our take. We wanted to get as much of these funds and projects as we could in California, and so it took a lot of collaboration.

I mean, the state really was in a facilitating role here because, as we will hear later, these were proposals that were made mostly on a competitive nature. So, you know, I went to Washington, D.C. with Commissioner Chong early on and we met with DOE and OMB, and we met with Legislative staff trying to make a case for "California is where you want to award these projects," but it is the private sector and the utilities that came forward with the innovative proposals, and the staff had to figure out how to leverage and maximize our research funds to help the competitiveness of these proposals, leverage our funds as best we could, and to do this fairly and quickly. And I think the staff did a very good job. We wanted more, of course. But I think – I applaud the staff's efforts for being quick here and creative. And we took on a lot of liability that we did not anticipate in terms of committing the R&D funds going forward, but I think it was a good gamble, a good venture, and I am very hopeful that this will all pay off. We will hear from some of the folks later on here as to how effective our approach was, but before we do, I would like to give you my thanks for the way you and the staff moved so quickly on this.

MR. GOMEZ: Thank you. If I may just add for a moment, a lot more that we have done in this market area, prior research and the thoughts about how to support these

projects for ARRA, I think, come from Mike Gravely, and he has been kind of the vision for us, and he has given us the leadership and given us some flexibility to go out and do the best that we can, and from my staff, that you know, we have been working under slower conditions, but we have been working long long hours, and so, you know, I thank them, and I also want to thank the folks who actually applied for support, the California-based projects, to folks that I have interacted with and worked with, as they developed their applications, it has been tremendous, it has been a great opportunity.

COMMISSIONER BYRON: Good, I concur. Mr. Gravely did an excellent job, as did all of the staff.

COMMISSIONER EGGERT: Yeah, just a quick comment, as well. And I think you are right, I mean, the fact that all of this came in at the same time -- we also had furloughs -- is a testament to the hard work that the staff did in maximizing the opportunity that was presented. I was very encouraged to hear you mention the Demand Response Research Center. You know, I think the fact that we have been contributing to developing some of the institutional and technical capacity over multiple years, I think, has benefitted us in being able to compete for these projects because we have kind of our go-to experts that we can draw upon, and I think that is just one example within PIER, and

there is also the California Lighting Technical Center, which I know has provided a lot of technical expertise to a lot of the projects that are being pursued with respect to lighting technology deployment, there is the Plug-In Electric Vehicle Research Center, which is also participating in evaluation of one of our cost shares, and AB 118 programs that we will be hearing about, the ETEC project, so I just wanted to commend the group, the PIER team, for having the foresight to establish some of these efforts, so that we do have that capacity here in the state to be able to pursue these opportunities.

CHAIRMAN DOUGLAS: And Pedro, briefly, I would also thank you and the other members of the PIER staff who worked with you, and for putting in the hours and making this happen because this has been tremendously important for the state. And I just have a couple questions, and these are not questions that we asked you to address, specifically today, so you are excused if you take a pass, I want to invite you to take a shot at them if you would like and –

MR. GOMEZ: I have got resources in the audience.

CHAIRMAN DOUGLAS: Well, that is good, I would like to invite members of the public and the speakers who are coming up later to also speak to them if they would like. But, I am interested broadly in where ARRA has moved us forward in our PIER agenda, and I will be asking the 118

staff the same question, where has it moved us forward exponentially? And in those areas where you see that it has moved us forward exponentially, what are some of the challenges that come with jumping forward exponentially in a way that was unplanned, and how do you see us working with the award recipients over time to address the challenges that are likely to arise? And finally, where has this focus on this tremendous ARRA opportunity led us to, by virtue of focusing on these opportunities, maybe invest less staff time and effort in other areas that are important parts of our broader agenda, that we may need to take a step back and refocus on once the ARRA challenge is not necessarily behind us because it will not be for many many years, but has at least moved on to the next stage? I guess I just wanted to put that out there as questions that I am looking at now, and invite you to take a shot at any one of those that you would like, and I also invite members of the public who have opinions on these issues to weigh in.

MR. GOMEZ: Okay, so maybe I will throw this out. Lots of the projects, a number of the projects, call for implementing Demand Response. That is something that we started through the Demand Response Research Center, but that is something that, you know, I think legislatively we are not to start using Smart Meters until – I think it is 2020. Doing these demonstrations and tests of demand

response on a larger scale is going to give us a great deal of understanding of whether this works or it does not work, where we can step in now, once these projects start unfolding, in supporting and actually developing the standards that need to be developed to allow not just the utilities to control the data that is being collected through Smart Meters, but allow the private sector to come in and provide their ingenuity and develop new products that can be used by consumers. So that is what I would say. Then, the second part, could you just repeat that second question because I had a response for you on the second.

CHAIRMAN DOUGLAS: So, what are some of the other areas beyond Smart Grid, if you would like to take a stab at that, where you see our agenda moving forward exponentially, what are some of the areas where the focus on ARRA and these tremendous opportunities that we did not want to let pass, diverted our attention from other issues that we may need to pick up?

MR. GOMEZ: Well, I will answer this in this way, so in the Smart Grid area, because we have been so focused over, what, the last year and a half, in supporting these projects, we have kind of taken a step back from funding research to overcome some of the challenges that we know exist. So, I would say that is where we have kind of fallen - I would not say fallen behind, but our focus has kind of

been diverted a bit. Now that these projects are going to unfold, we will be able to jump back into the fray, but that has taken some time away from resolving some of the issues that we know are there. And then, I see my boss is standing up and I think he would love to chime in.

MR. GRAVELY: Mike Gravely from the Pier Research Program. I would like to answer just a little bit of this. I have been tracking this quite a bit and I would say that there are some distinctive advantages and advancements that I believe, again, from my perspective of watching this, and would like to say publicly here to this, and also say that there are some challenges that come out of that, too. So, the advantages, I would think one of the big advantages is, in fact, that there was such a large amount of money introduced at a quick time, so projects that were ready, PIER projects that we have been working in areas like synchrophasors, energy storage, integration of renewables, integration of distributed resources, and demand response, we have years of work and many of the projects that you will hear about today, these are key elements of that, from the different projects, so that we were able to advance and are able to advance in technologies that would have probably taken a long time to get there, normally, or maybe never gotten there before this. And, for example, the awareness of energy storage needs today, I have been involved in

energy storage for 20 years, it is a generation above what it has been in the last 10 years, and the opportunity, the technologies that are being proven, the large scale projects that are out there over the next few years, the opportunity for huge advancement, the research that we do indicates that we believe we will need thousands of megawatts of storage in 2020, so we have time to make that happen. So, there has been quite a bit of advancement in technology that we are ready; one of the disadvantages that we have run into is that this – it does focus on what I will call "shovel-ready" projects, and so, when you are doing research, you know, better technologies come along, and you actually advance those technologies, and when you go commercial, maybe you are on the second or third generation, so there is an opportunity here that we could end up with some current technologies in large scale that may not be the technology we would have advanced, had we taken a five-year timeline. But I think, at the end of the day, we are better off. I also think one of the major advantages of ARRA, from my perspective, and we will hear some today and you can certainly ask SMUD next, but I believe this opportunity has advanced the public utilities in California, the opportunity for them to go after – many of the utilities got funding – so I think the technology integration, the capabilities they have, where they will go in the future, I believe the public

technologies in California will be better off because there are a couple of aggressive ones that have got such good projects, I think they will learn more, and they typically have been – I will say in the shadows – of the larger investor-owned utilities, so I think these ARRA funds have given the public utilities a chance to go where they want to do, and have some large funding to do that. So I think that is a big win for us here in California. So, I think the challenge is going to be – the last statement – would be integration. We would like one Smart Grid in California and not five or six, so one of the challenges we have, as we put this new technology and old technology together, and we look at different utilities and public programs, and everything else, is that we develop a system that will be interoperable in the future, and so, you mentioned before, that is where we will focus a lot of our attention is understanding what is out there and helping the process so that we field systems that will work in the future and we do not use – I guess I heard a good analogy before, you know, the cell phone charger – you could have 25 cell phone chargers and not have the one you need, as opposed to a USB port where everybody can plug it in, and anybody can use it. We would like to go the USB port route for assisted cell phone charger route. And so we think it is part of our responsibility in sharing information to help to go that

route.

CHAIRMAN DOUGLAS: Thank you.

MR. GRAVELY: Thank you.

COMMISSIONER EGGERT: Actually, that reminds me of – I guess it is a question relevant to these projects, and actually something you had said, Pedro, which is the need for this information to flow, to provide an understanding to the parties to be able to further develop these technologies into the market, and I think that is true in a lot of different areas beyond the Smart Grid, as well, and I know we have activities going on for Monitoring, Verification and Enforcement, but I would be curious if the future speakers might be interested in commenting on how we are going to make this data available. I think this is one of the great opportunities of ARRA, which is that there are specific reporting requirements, but then, if you take advantage of that information, we are going to have to actually follow-up and make sure that it becomes useful for other parties to use either for research or actual commercial development.

MR. GOMEZ: Well, if I may, one of the projects that we are in the process of funding is actually data gathering and the development of a website that will track all of the projects, not just in California, but nationally, and so that would be one of the avenues that we use for sharing what is coming from all of these projects.

COMMISSIONER EGGERT: Thank you.

COMMISSIONER BYRON: Thank you, Pedro.

MS. KOROSEC: Do we have any questions from the audience?

MR. SWEENEY: I had a question. There is a lot of talk about –

COMMISSIONER BYRON: Please identify yourself.

MR. SWEENEY: Oh, J.P. Sweeney, Central Transit & Development Corp. The question I have is, there is a lot of talk about existing projects and the ARRA funds that had been basically already allocated. What is going on for the future and future projects? Is there money available for future projects, as well? Will these programs continue?

MR. GOMEZ: Yes, so as I told you earlier in the presentation, PIER receives $86 million a year to fund research, we set aside $30-35 million of that block to support our projects, so the balance is available for continued research.

MR. SWEENEY: Annually, okay. Thank you.

COMMISSIONER BYRON: You know what? Let's go ahead, leave it on, go ahead and turn it on and leave it on.

MR. KRIEGER: Doug Krieger with CALGreen at Work, and I would like to thank you all for putting this on for the General Public. One of the comments – reoccurring comments – that are being made here today is the

institutional research that is propelling a lot of these innovations and funds. I would just encourage the Commissioners to remember that HP and Apple came out of a garage, and that what I mean by that remark is, I think that here in California there is a great deal of innovation and creativity outside of the institutional research platforms, and that you should keep this in mind. We are a private, public, philanthropic, consortium of companies, which have been galvanized together at the behest and encouragement of the Governor's Office of Economic Development, and when we had the smart innovation vehicles and transportation and the summit that the Governor just put together, he looked at our vehicle, which gets about 150-170 miles a gallon, and said, "How come I have not seen this before?" And I said, "Well, that is because you have not visited the chicken coop in Rio Linda," and sooner or later, the Governor's Office came out to the chicken coop, and it is amazing what can happen in a chicken coop with innovation and creativity. Many things are going on. We are coming forward and saying to the Energy Commission that, "Hey, there's a lot of other things going on out there." It is up to us to find out a way to work together and to find out these innovations. One of the questions I did have is that – and, Commissioner Byron, you alluded to this – and that is, what would happen if AB 32 were turned down? What are the implications that we might

be looking at as far as a lot of this funding and so forth? And maybe you could address that just real quickly. Thank you very much.

MR. GOMEZ: I would like to maybe defer to Commissioner Byron, first, and then I would like to throw it back to Mike Gravely to answer that.

COMMISSIONER BYRON: Mr. Krieger, you know, I wrote that question down, I am saving that to ask one of the participants that can present this, so I do not recall really alluding to that yet, but it is certainly on my mind, and I am not going to answer it because I have very strong feelings on it, but I would like to hear from others in the audience. So, Pedro, I know you passed it to me, but I am going to pass it to Commissioner Eggert.

COMMISSIONER EGGERT: I would just make a quick comment. I think you are talking about the Governor's Summit on Vehicles and Fuels –

MR. KRIEGER: And then AB 32 implications –

COMMISSIONER EGGERT: Right, actually at that summit I was moderating the second panel, and certainly, from both the first panel and the second panel, which were made up of some of the business leaders that are actually deploying these technologies and making these investments in the state, the one clear message that I heard from them was the need for durable policy, that, if there is – you know,

incentives are great and they said really nice things about our AB 118 program, especially if they were recipients, but even if they were not, they said it was important to have that as a signal from the state, but they said, even more importantly than the incentives is durable policy, and so I think sustaining our environmental policies, including AB 32, which they called out explicitly, is a very important factor in bringing that investment, and continuing these activities beyond the end of the Stimulus program.

CHAIRMAN DOUGLAS: I will just state briefly, I agree with you, Commissioner Eggert. I have always said, and always thought, that AB 32 itself was only possible because it was built upon decades of stable policy in California to promote alternatives to oil, to create a cleaner electricity system, and promote energy efficiency from renewable energy, clean the air, which was a major major driver throughout our state's history, and these frameworks built the institution and institutional knowledge, and sparked tremendous innovation and development of new technologies and new ways of thinking and working in California, that put us in a position where the state was even able to assert the leadership that it did, with AB 32. And so, I think Commissioner Eggert is exactly right about the importance to stable policy and how that has gotten us to the tremendous opportunities that we see today, and I

would be very concerned about the future of that if there were a significant change to AB 32, so we are obviously watching closely and we are moving forward, and there is such talent and such innovation, and such drive in the state, we think we can capitalize on it.

COMMISSIONER BYRON: All right, I cannot help but comment now. You know, Commissioner Eggert said "durable," you used the term "stable," I will use the term "regulatory certainty," and it is great to have your perspective, Madam Chairman, AB 32 builds on many years of policy work in the state, and AB 32 does not represent all of the policies. We have got energy efficiency programs, renewables, there are a lot of policies that have moved forward, and this Commission, prior to my joining it, my predecessors have certainly moved the ball forward, so we are very pleased with where we are today, these ARRA funds tie into this, but I will say it as strong as I can – well, I am sure I could say it more strongly – but I will say this, if we whipsaw the investment community by altering the path that we are on right now, it will definitely have a detrimental effect on the economic recovery of the state. And I spent a lot of time in Silicon Valley, that is my home, and this has been a topic that has come up on numerous occasions in recent summits and that include venture capitalists and other investors in technologies, so I apologize for having stated

my opinions before I was able to ask others in the audience, as well, but it is tough, and I am very interested in hearing from those that will be before us as we finally move on our agenda here. I am very interested in what others have to say on this topic, as well.

MR. GOMEZ: There is a question online, but before we look to address that, I just wanted to follow-up, Mr. Krieger, that, in fact, we have not forgotten about the ideas that are percolating in garages and chicken coops. Among the process of solicitations that we run through the Commission, additionally, we have the Energy Innovation and Small Grant Program that is available to you to apply as many times as you want, and so there are avenues that we can help. And if you have anything in particular that you are trying to promote, feel free to contact me, the contact information is there, and I will put you in contact with our Small Grants Program; however, if it is something else, I will do my best to help you out.

MS. KOROSEC: All right, we have a question on line and we are going to unmute the line. Okay, go ahead, your line is open. Craig, you are going to have to speak more loudly.

MR. HORNE: Okay. This is Craig Horne at EnerVault down in Sunnyvale. We are a developer of stationary energy storage systems [inaudible]. I would like to thank Pedro

and Mike for their help. Can you hear okay?

MR. GOMEZ: Yeah.

MR. HORNE: I have a lot of static on mine.

CHAIRMAN DOUGLAS: If you could speak slowly and extra clearly, I think our Reporter would be pleased.

MR. HORNE: Is this better? Hello?

MS. KOROSEC: Yes, that is better. We cannot speak loudly here because we have got the mics turned up so loud to get you loud, so just go ahead with your question.

MR. HORNE: Thank you. Well, I would like to thank Pedro and Mike for their support and I think the PIER cost sharing with small companies, we feel, is very important, and especially in [inaudible] energy storage because it does provide certainty and more confidence, and [inaudible]. But my specific question, has the status of PON-09-002 been addressed? I had a little bit of audio difficulty here during Pedro's presentation, so I do not know if he commented on it verbally or not.

MR. GOMEZ: Okay, so we are in the process of announcing the awards from PON-09-002, we should have those out probably in the next week or two, and that is where we stand on that right now.

MR. HORNE: Terrific. Thank you.

MR. GOMEZ: Thank you.

MS. KOROSEC: All right, we will move on to our next

speaker, who is Jim Parks from Sacramento Municipal Utility District.

MR. PARKS: Anyway, I am delighted to be here today to talk about what SMUD is doing with our Stimulus money. As was mentioned earlier, we got $127.5 million from the Smart Grid Investment Grant. Yes?

COMMISSIONER BYRON: Mr. Parks, please introduce yourself so we will all know who you are.

MR. PARKS: Jim Parks from the Sacramento Municipal Utility District, also known as SMUD.

COMMISSIONER BYRON: Good.

MR. PARKS: We received $127.5 million from Smart Grid Investment which, as it turned out, was 63 percent of the money that came to California for that one. It was very exciting and slightly embarrassing to receive that much money. We were wondering as we were going through the process whether we were going to get, you know, 50 percent of the money, or 75 percent, or whatever, but we got the full amount, and so it was very exciting for us. And staff gave us several questions, and what I am going to do is just answer those questions across the board.

We are in line for $1 million of PIER funding for a $308 million project. The project includes several elements, they are partner projects, and I will talk about each of these elements briefly, Advanced Metering

Infrastructure, a Consumer Behavior Study, Demand Response, Distribution Automation, Electric Vehicle Infrastructure, and, of course, Cyber Security. The only thing that is not really listed on here, but which is very important and has been alluded to earlier, is integration. We have got a bunch of proscriptive projects, from my perspective, and really the big piece is going to be bringing these altogether into a cohesive whole. And I think Mike talked about that, too, we do not want five or 10 Smart Grids in California, you want one cohesive Smart Grid, and we want to work in that direction. We partnered with several agencies in the Sacramento Area, the Los Rios Community College District, which has four campuses in SMUD service territory, the Department of General Services, and California State University in Sacramento. This is the way the funding lays out, and I am not really going to go over this in detail, but you can basically see the partner projects like DGS, $24.9, $8.4, $9.3, down the list there on the right-hand side, and basically they are committing to cost share 50 percent, so half of that number is what they are going to get from the Federal dollars; and then, you can see on the bottom, $308 million worth of projects.

What we are looking at right now, we do not have the PIER contract in place at this point, but we are looking at using that money to help fund distribution automation, but

even though it seems like it is just a single focused element, PIER will get the complete reports that we send to DOE for all of the projects, and I think that is going to be one of the big benefits here because there are local projects going on, distribution automation in and of itself does not appear to be really so much R&D, but you are going to get the full report and the full package, and I am hoping at the end that we will be able to evaluate each one of these individual projects and determine like cost-effectiveness, benefits, issues, those sorts of things. So, at the end, there will be something that is revocable for the State of California.

Our partner projects, each of the entities that we are working with are going to install energy management systems, or upgrade their existing energy management systems. The college campuses are going to have electric vehicle infrastructure installed, there will be charging stations which will be what we call the Level 2, the 240 volt charging stations, and there will be Smart Chargers so we communicate with them. We have got a fairly significant amount of money going towards Auto DR, we plan to test that in the facilities and those that want to implement it on a more permanent basis, and we would certainly do that. The CSUS distribution system will be upgraded and they will also install Smart Meters on campus. CSUS actually gets what we

call transmission level power, it is really distribution level 12 kV power, and so they actually, on a lot of their buildings, do not have individual meters, and so they have a master meter from SMUD, so we are going to do some individual metering there. Advance metering infrastructure, we are in the process of doing this right now, we have Landis & Gyr meters, and we have Silver Spring networks. We have installed about 63,000 meters at this point, and we are holding off until the beginning of 2011 to really complete the project. We are just working through some different issues and trying to make sure everything is working properly, that the customer communication is in place and those sorts of things. A Consumer Behavior Study – this is going to be an interesting one for us, we have done several critical pricing projects in the past, but we are planning to expand this to a much larger scale, and we really want to see how customers respond to this. I think, you know, we are talking about installing Smart Meters across the state, and if you do not do some sort of a critical peak pricing, or real time pricing, I think you lose a lot of the benefit; if you are just going to do hourly readings, you might as well have just stuck with the old system, from my perspective. So, I think somewhere down the line, this is the direction that we need to go, and this is where we are going to get some of the big benefits from Smart Grid. We

are going to install programmable communicating thermostats and we are going to check the customer response to these technologies. We are going to do some significant work in demand response in our Draft Integrated Resource Plan right now, we are calling for 375 megawatts of demand response through the next cycle, which is really over 10 percent of our ultimate peak load, so it is a pretty big number. And we are going to do some projects on that. And we are starting a project right now, this summer, and we are planning to expand that next summer to a larger scale, to determine what works and where we get the biggest benefits.

Distribution automation – we are doing a lot of work in this area, we are expanding the SCADA, Supervisory Control and Data Acquisition, in 36 substations. One of the really – the most excited about – is really the Conservation Voltage Reduction, which is the last bullet there, where we will actually at the substation level reduce the voltage for the purposes of saving energy. This works well if everything is in place correctly. Depending on what equipment you have on the line, the system may compensate for that reduction and actually boost the voltage back up, and so you have to make sure the system is capable of actually handling that, so we are going to do some experiments in that area, and I am excited to see what type of energy savings we will get from that.

On the Electric Vehicle Infrastructure, if you look down at the bottom, the number is actually covered up there in red there, but it is 1,100 megawatts potentially of electric vehicle load by 2030 that we are seeing in just our service territory, this is not California, so we are looking at essentially the equivalent of two utility-scale power plants worth of power that will be needed to supply the load of electric vehicles. And so, from our perspective, this is something the utilities need to prepare for and put a significant effort into being ready when these vehicles come. Some of the other factors that come into play here, when you put an electric vehicle on an old transformer, it can be anywhere from like a fourth of a house to, if you have a Tesla, it could be multiple houses, added to that transformer, and if you are at your limit already and you start adding electric vehicles to a transformer, theoretically you are going to overload the system. And so this is something that is not really a major concern at one level because we are planning for it, preparing for it right now. We are going to install 180 charging stations through the Smart Grid Investment Grant, we have some other grants where we are also going to install additional charging infrastructure. Also, we want to test the impacts on the Grid. I told our General Manager, I said, "Look, I want to put some electric vehicles, or the equivalent of electric

vehicles on a transformer, and I want to wait until the third day of the heat storm when we are at our very peak, and then I want to plug in those vehicles and monitor the transformer." He kind of gave me a dirty look. You know, I told him, "Look, we'll make sure that we can unplug them right away if we have to."

Cyber Security – SMUD has a cyber security plan and we have been really state-of-the-art in this area, it is an important area, it is a big focus of the Federal Government, and we want to make sure that our system is secure. When you are working with a dumb grid, you do not really have to worry about cyber security so much, who is going to come in and control your system when there are no controls with which to control it? And so, when we automate everything and everything is computerized, then there is more opportunity for the bad guys to come in and hack your system, so we need to be diligent in that area.

Okay, here are some of the questions that were asked of me, you know, the expected outcomes. And unfortunately here we are, job creation, energy savings, greenhouse gas reduction, and I am like "to be determined," but I will say, and we have made this public all along, the initial out-of-the-chute thing for us is going to be eliminating approximately 80 meter reading and meter reading supervisor jobs because of the advanced metering infrastructure and the

automation that that entails. But, having said that, there will be additional jobs created, mainly in the IT area, manufacturing area, installers, and those sorts of things, and so I do not really know what the net outcome is. We are developing an impact and metric plan right now and that will take a look at these things. But, other outcomes that we see, we are going to enhance our utility infrastructure, this is a big boost for SMUD. You know, if we had not gotten the $127.5 million, things would move much more slowly for us. It adds transparency and control to our system and it is going to promote customer engagement. We see the customers as actually being a part of the solution for us in being able to save energy and reduce their peak loads and control their energy use. It is going to promote distributed generation and improve air quality, and it is also going to integrate the intermittent renewable resources, which from the utility's perspective, is kind of a big deal as we see our renewable energy standards and renewable portfolio standards going up, those are typically intermittent resources that are difficult to control and the utility has to manage those. So, typically, the higher the number, like the 33-1/3 percent or something, that gets to be a serious issue for the utility.

Some of the challenges - AMI issues across California, PG&E was kind of the first out-of-the-chute in

Bakersfield to experience that, and believe me, everyone else in the state and probably across the country took notice. And we enhanced our communication plan to make sure we were communicating with other customers, that they knew what was going on to ensure that we were not going to run into the same problems. The emerging technologies marketplace, I think Mike alluded to this earlier, that there are so many people coming out of the woodwork now with new technologies, the chicken coop inventors, you know, the garage inventors, and those sorts of things. And, you know, from our perspective, this is great, and yet at the same time we have this parade of people coming across our pathway and partly I am confused, and partly I am wondering where are these going to be two years from now? Where are they going to be five years from now? If this system, if we deploy it on a broad scale and it suddenly fails, who is there to help? Who is there to ensure that it is going to continue working? So, there is some confusion, there is some reliability issues. Lack of standards is another big deal, if you are a manufacturer, you go out and manufacture some product, the people come in today and they go, "Well, we have Zigbee and we have this and we have that, and it is capable of doing all these things," well, somewhere when standards are put in place and manufacturers will have some assurance that this is the way we need to make it, and

everyone is on the same boat. I was pleased to see recently that they even developed the quad for the 240 volt charging and the 120 volt charging, it is like, that is great because you do not want 10 manufacturers coming out with 10 different systems, and you buy an electric vehicle and you are carrying 10 whips in your car because you do not know what charging station you are going to come up against. And so, that is great.

Resource challenges? I mean, right now, you know, unemployment is very high, but yet in a Smart Grid arena, I still think there are going to be some issues about, "Are we going to have to train people that we need to actually implement this for us?" There are a lot of people buying equipment, some of them manufacturers that are really the top ones, the key ones, they are actually having trouble meeting their quotas, and so there are some issues there with getting the equipment and the staffing in time to do these projects. For us, this is not really a concern at the Commission so much, but the federal requirements, you know, the contracting, the reporting, the Made in America clause, and those sorts of things, they become kind of an issue because most of the stuff is not made in America, and it is like, how can the manufacturers kind of adjust their message to make it look like it was made in America, at least, when most of it is made in China? And one of the short

timeframes to deliver, we have three years on this contract, and we are talking about a massive massive project, and that is where the technology thing comes in, too. You have got all these new technologies and you go, "What are we going to deploy on a fairly broad scale that is going to get us where we need to be, and it is not going to be obsolete at the end of the project?" You know, I do not want to this mass scale deployment and then somebody go, "Oh, let's pull it out two years from now because everything changed."

So, what would we do differently? You know, in terms of how we did our proposal, we would not really do a whole lot differently, I mean, the funding opportunity announcement came out, the announcements of the PONs came out from the CEC, and we responded to them. You can never give people a full year to work through these things, or you will never get the job done, and so, you know, within the timeframe we had, we did the job we needed to do, people worked a lot of overtime, I cannot really say we would do a whole lot differently, especially since we won; now, had we lost, I might have some other ideas about what we might do differently, but, you know, we were successful.

What could CEC do differently? I will say that, in the early application process, I thought it was pretty straightforward, and the staff was very helpful for us, the notices were issued, and I felt like that process went

smoothly. Now, we are moving forward in to the next phase and I am concerned about reporting requirements, quite honestly. The Federal reporting requirements were termed – I asked a guy one time that worked for the Federal government, I said, "Are the reporting requirements onerous?" And he said, "No," with a straight face, "No, double onerous." Oh, great. And so, we have got the Federal reporting requirements and now we are adding on some CEC requirements, and I am just, really, if there is anything you can do to make the Federal requirements good, you know, that is the report, that would help us tremendously, and I would just point out that, you know, we have got a $308 million project and we are looking at a significant grant from the CEC of a million, but it is less than 1/300th of the project, and so, you know, we are not willing to really change our whole reporting or develop two reports, so if at all possible, if the Federal report can work, that would thrill us to no end. And I would just point out here that our agreement with the CEC is not final yet, and that is not really staff's fault. [Phone alarm rings] I just gave myself a timeline so I would know I should stop talking. And so, we are working through that and staff has been very helpful on that. That was perfect, I'm right here at the last slide. We are moving forward with our Smart Meters project, our communication network is

99 percent complete, we have over 60,000 meters installed, 95 percent of the customers are satisfied, which sounds good, but, you know, if five percent of them actually came to our Board, that would be a problem, but I think it just means that they are not thrilled, but they are not really complaining too much. We are testing the meters and the system through year-end, and we are really going to go out with a full scale deployment starting January 2011. Our contract with DOE is approved, but we are still working through some of the details. Things change between the time you submit your proposal and the time the proposal is approved, and so we are kind of adjusting the project here and there. And then, as far as our own procurement, you know, we do it similar to the state, we issue an RFP and we will procure products that way, and that is why I tell all the vendors when they come in, they come in and want to show us their product, and we are like, "You know, there is going to be an RFP process, and that is how we are going to evaluate this." And then, we are performing pilot tests where necessary, right now we are doing some pilots with the distribution automation before we really do the broader scale deployment on that, to make sure the stuff works. So that is it.

COMMISSONER BYRON: Mr. Parks, thank you. You know, you had indicated early on that, when you won this proposal,

you were very embarrassed, well, you should not be. Clearly, DOE recognized your proposal represented an innovative technology and approach here for California, which is saying a lot, because we have moved ahead aggressively with so-called Smart Meters, but there are many other utilities in the state that were equally embarrassed, if not more so, with your proposal win.

MR. PARKS: I would guess. I think I said "slightly embarrassed."

COMMISSSIONER BYRON: Yeah, modestly embarrassed. But the word is out, you know, that the utilities' Smart Grid programs, that this agency has put forward, and really, there are a lot of third parties out there, you know, let's call them high tech companies that have been looking into this space, that have a lot of – they have applications, they have got hardware, software ready to go, and I have met with a number of them, and they are looking to this project, and they are looking to SMUD, to help provide a platform and, let's say, an example for how the state should proceed. So I guess I am cautioning you, you are a little bit apprehensive about that, and the possibility of deploying technology and/or all these other companies and where will we be in two or three years if this does not work, I am concerned about that, as well; so, it is extremely important that your program be effective. Some of the utilities in

the state have given the word "Smart Meter" a bad name, or "Smart Grid" a bad name, and you cited one example, but there are other examples, and we need to correct that process, and it is in terminology. So, if I may, you know, this whole notion that we look at this from the utility perspective has to change, for instance, I will give you an example that you may or may not agree with, but this whole notion of "critical peak pricing?" Scratch that term, that is looking at it from the utility – and the policy makers' perspective. We have problems that we are trying to deal with on the grid, and look at it from the customers' perspective, be customer-centric in this regard, I just jotted down, maybe call it the "customers cost-saving pricing" because that is really what they are going to be interested in and what they are after here.

MR. PARKS: Point well taken, and I would submit that we probably would not call it critical peak pricing to our customers because they would not have a clue what we were talking about. We would put some name on it, you know, like the "Pecan Street Project."

COMMISSIONER BYRON: Exactly. So, you know, and the expected outcomes, you listed the ones that we are certainly interested in, but I would add that the primary expected outcome will be the choices that you will bring to customers, reducing their energy use, saving money,

increased control, convenience, these are the goals that I hope you will accomplish and, again, we are looking to your program, I think it is extremely important and it is going to be an example. I know when I meet with some of these technology companies that have third-party opportunities, they know where they need – we send them to you because, clearly –

MR. PARKS: Thank you.

COMMISSIONER BYRON: -- that is right, they know where the opportunities are within the state. So, there is a lot at stake here, the bad press around the so-called Smart Meter is not very good right now, and it has done a great disservice to everybody, while the investor-owned utilities under mandate saw millions of so-called Smart Meters. There is a lot at stake that we change the impression here that the consumers in the state have around that.

MR. PARKS: And I agree, and that is kind of a balance, how can you do it effectively, in a quality fashion, successfully, but in the time allotted?

COMMISSIONER BYRON: So, good luck.

MR. PARKS: Thank you. We will do well, I have utmost confidence in our staff and our ability to perform.

CHAIRMAN DOUGLAS: Glad to hear that because we have seen great innovation from SMUD. I have observed that SMUD

has really taken this opportunity in ARRA and applied for aggressive programs in a number of areas, and been quite successful across the Board, so we will be looking for very great things from SMUD, not only in this, but in other areas. A quick question, you mentioned Los Rios Community College District is a partner, and I assumed when you said that they are providing workforce training – is that correct?

MR. PARKS: They are not doing training as part of this FOA, but they are doing training through another loan.

CHAIRMAN DOUGLAS: So, in this case, they are a partner for the EV charging?

MR. PARKS: EV charging and energy management system upgrades.

CHAIRMAN DOUGLAS: Okay, good. Thank you.

COMMISSIONER EGGERT: Actually, so you had also mentioned the potential challenge of finding adequately trained work force and I know we do have quite a number of work force programs. I presume you have looked at those and seen whether or not they are suitable for –

MR. PARKS: We are partnered with several organizations on that, yeah.

COMMISSIONER BYRON: And the Energy Commission is not your source of work force, okay? [Laughter]

MR. PARKS: You have noticed, have you?

COMMISSIONER BYRON: SMUD has had a very good track record of picking out some of our excellent staff here at the Commission.

COMMISSIONER EGGERT: Actually, just a follow-up, I have another follow-on question to Commissioner Byron's question about the behavioral aspects of your study. Is that information – will that be readily available to other research institutions and others to take a look at it?

MR. PARKS: You know, some of that is kind of to be determined, but my full expectation is that, at the end of the project, there will be some sort of a final report that really identified the things that were done, what the benefits were, what the costs were, and those sorts of things, that would be available to everyone. And I believe that one of the elements in the Energy Commission contract, which is probably one of the things that I think – how should I say this – probably should stay in there, you know, because I do not think we really have a final report requirement in the Federal contract. And so, I think it is important that we have a final report that is a public document.

COMMISSIONER BYRON: Good.

MR. PARKS: But all that other stuff, let's focus on the federal reporting as sufficient.

COMMISSIONER BYRON: We got that.

COMMISSIONER EGGERT: And actually just one – on the customer preferences for information and messaging, does that include options for real time pricing?

MR. PARKS: What that is focused on more is, you know, they will be able to get day behind information. We take hourly reads and we take it all in at one time in the evening, so the customer can look at their energy use information the day behind, and that is more what it is focused on, and there will be different methodologies for doing that, it might be a display, it might be through the Internet, and so forth. And I think I missed a piece of your question, could you repeat that again just to make sure I am getting it right?

COMMISSIONER EGGERT: Well, actually, my curiosity, I think you answered it, which is whether or not there would be the opportunity to test different real time pricing models, to basically push pricing information through the meter to the customer.

MR. PARKS: I am not sure how many pricing models we will test. What we are really looking for is to put in place – or to test a price that we would actually consider doing broad scale if the timing was right and we had all the right approvals, and so forth, and then see how that works, and then tweak it, so that we are trying to get something that we could actually potentially use in the future, do not

just willy nilly test prices that we would never use on a broad scale, so we are looking at testing prices, but we want to make sure it is something that we would consider using in reality.

MS. KOROSEC: All right, do we have any questions or comments from anyone in the room? Pedro?

MR. GOMEZ: I just wanted to thank Mr. Parks for helping us out through the process. But, more importantly, I wanted to weigh in concerning how our plan is to essentially accept whatever you are reporting to DOE as the deliverable to us, so it would not be some additional requirement, that is our plan at this point.

MR. PARKS: Okay.

COMMISSIONER BYRON: There you go, a public commitment to that.

MR. PARKS: I heard that public commitment and I will get back to you with our proposed contract, we will work through it. Thank you.

MS. KOROSEC: All right, we are running just a bit late. I apologize, I am having some technical difficulties here.

CHAIRMAN DOUGLAS: Suzanne, before we begin, we are talking about lunch logistics over here. We were thinking that if the last speaker is able to pick up at 1:00, that we would go on with this presentation and then break for lunch.

MS. KOROSEC: Yeah, I think we were checking with that speaker, he is presenting via WebEx and we were waiting to hear back whether he was okay with doing it after lunch, so let's go ahead with this, and if we hear differently from him, I will let you know.

CHAIRMAN DOUGLAS: Thank you.

MS. KOROSEC: So now we are proceeding to Mr. Nichols from Sempra – SDG&E, pardon me.

MR. NICHOLS: Okay, thank you. Okay, I am between everybody and lunch, as usual, thanks. Thanks for the opportunity to come and talk about our project, so the members of the audience, members of the Commission, thank you. We are pretty excited about our somewhat unique project. I am coming here not as part of the utility's specific Smart Grid team, I am actually an IT employee, I am a Director for Network and Communications for actually both utilities, for Southern California Gas and for San Diego Gas & Electric, IT as a shared service of both utilities. And I am here because our proposal, again, our project and our proposal looks a little bit unique. I enjoyed listening to the gentleman from SMUD, we had a similar proposal from SDG&E that was not as successful as SMUD's, but we had this proposal that was accepted. We were unique in that we are not selling meters, we are not doing demand response directly, we are not doing distribution automation or any of

the other, you know, Smart Grid applications directly. What we are doing is laying down a foundation. We started with a very simple, but what I think is a somewhat profound idea, which is, I do not care how you define a Smart Grid, I do not care what applications you are talking about, any notion of a Smart Grid needs to start with secure, pervasive, reliable, communication systems, some of which do not exist today. And then, you know, that is a subject of some debate, but we have debated it at length with partners and ourselves, industry, over the course of the last couple of years, and that is the fundamental idea behind our project. So, given that notion, that any idea of a Smart Grid needs to start with a secure wireless service, now, notice I said "wireless," I made it pretty clear to you before I am finished, I am an Engineer, when we look at doing the communications for any kind of application, whether it is in traditional information technology or whether it is in this new genre called Smart Grid, or it is, I think people before me noted, it is not that new, it has just got a new and timely label, we would like to start with wire communications, whether it is fiber optics or copper wires, we would like to start there. But, when you start thinking about what you are trying to do with a Smart Grid, that is not going to be possible. I started asking it as an Engineer, I started asking questions of my Smart Grid

brethren a couple years ago, saying, "Where are you going to put the sensors for these applications?" "Well, you know, we are not really sure yet, but it could be anywhere in our service territory. How much capacity are you going to need?" "Well, we're not really sure yet, but it could be a little, it could be a lot." I started asking questions and I started getting answers that were not all that encouraging to engineering staff. But what I came up with is what you see at the bottom of this slide, there really are two modes of communication that kind of fell out of all this, there is a need to build some kind of pervasive wireless network, something that gives me the ability to deliver bits anywhere on the grid, whether it is for monitoring, whether it is for control, whether it is for some kind of very important, you know, kind of real time application, or just simple on/off monitoring, so that there is a class of applications that require pervasive communications, I have to cover – in our case, it is 4,000 square miles in the San Diego Gas & Electric Service territory, in the Southern California Gas Service Territory it is more like 20,000 square miles, it is a grand challenge in terms of engineering, and wireless is the only way to go, so that is why that word is there. And the other kind of application that we saw falling out, the other general class, was high performance, or high capacity, and the word that gets used is broadband, and broadband is

one of those kind of ill-defined words, but in general, we are defining broadband as somewhere between 1 and 5 megabits per second, and we are also defining it as having high performance and communications terms that means low latency, and very rapid response time. So, our program, in a nutshell, is to build that reliable secure wireless service that supports Smart Grid, Smart Meter, field service operations, because just because we have a Smart Grid, we are still going to have people running out there with trucks trying to fix things, and solve things, reinstall things, and so on, that does not change in the new world. Transmission distribution operations and, in fact, emergency services, these are all the things that we are trying to support with our project.

You know, I really, I kind of struggled on whether to put this slide in here or not, there is a lot of geek-speak in here, a lot of things that you probably do not care about, but the basic ideas remain fundamentally straightforward. Our project has about four tracks, foundation services is the project that will put up multiple radius systems that have pervasive coverage. Some of them are for fixed utility assets like substations, reclosers, monitoring points, some of them are for mobile assets, that is, people in trucks, typically. Then, we have a track for broadband services and, you know, broadband services,

because they are higher capacity and higher performance, we and the ratepayers simply cannot afford to put them over our entire service territory. It would be prohibitively expensive. So, we are selectively applying hot spots of coverage, oh, a mile, a square mile or two, for these broadband services at substations, at high value grid assets, and places where we are going to install synchrophasors, because that is one of the very difficult problems that we have to solve for the Smart Grid future, how do I deliver large amounts of information with very high performance communications? Today's communication systems typically are not designed for that, and that is one of the innovative things about our proposal, is we are doing just that.

Control services is the other, I think, truly innovative part of our proposal, and I think it is the part that the Department of Energy was particularly interested in. Utilities – we are like all the other utilities – we have been installing, and private communication systems, and using public communications systems from the public carriers for decades. But they have always been single purpose, one communication system for this application, another communication system for another application, and on and on. When we looked at this a couple years ago, we asked the question, "Is there a consolidation play possible here? Is

there an economy of scale possible here? Does the technology and the way we can operate in the future support a better way?" And it turns out it did. It turns out it did, and we will talk about that a little bit. Finally, migration, this is a project that is building a communication system for the utility and its operational partners, including in some cases public safety. So, we are going to have to migrate people from these old communication systems to the new ones, and so that is the fourth track in our program.

This is a picture of pretty much when I talked about to date, this is a very simple, straightforward project in some regards. We are installing several wireless communications and radio networks over the Southern California landscapes, you know, in San Diego County, primarily, that will provide selectively very high capacity to applications like synchrophasors, here referred to as wide area measurement/control substation automation, that will provide a lower amount of capacity pervasively, over our entire service territory, somewhere between a megabit and two megabits per second, and that is the deal with the applications of a Smart Meter backfill and recloser switches, transformer, and so on. We also have a strategy to deal with the so-called stranded or hard to reach meter problem, we have heard a little bit of talk today about, you

know, that we need to change the public's perception of Smart Meters, we are a million plus meters into our Smart Meter roll-out of the separate initiative, that this program will end up retrofitting some of the communications, and one of the things we are going to be able to do is we are going to be able to reach certain meters and certain customers that just are not feasible today, just not practical, we are going to be able to do that.

And finally, at a lower bandwidth, or lower capacity, we will be supporting the mobile field users, everything with integrated security and integrated management control. I cannot emphasize enough, I mean, that is really the core of our project and our proposal and our idea, is that this communication system is the foundation upon which Smart Grid applications, Smart Grid benefits, whether it is benefits to the ratepayers, benefit to the utilities, benefits to all, this is the foundation that it will be built on.

This is our roadmap, our Phase one project which covers SDG&E, and will enable about 20,000 new communication endpoints of different types, it is a $63 million project over two years. I will get into the cost breakdown and that in just a minute. It will deliver a lot of new capabilities, 10-100 times multi-data capacity delivered to the people in trucks who would like to – you know, we would

like to be able to deliver them maps, we would like to be able to deliver them Web-enabled information, we would like to be able to deliver them video, and so on, and we cannot do that with the systems today. Video, I mentioned. Low latency service to substations -- that is really huge. There is a lot of talk about superphasers, and if you have fiber to all your substations, synchrophasors are certainly doable from a communications point of view. If you do not, it is a real challenge, and this is a way to bridge that gap.

The ability to reach remote Smart Grid assets, one of the things I asked when I said, "Well, help me understand what communication system I need to build, where are the wind farms going to be." "Well, somewhere around east." "Where are the photovoltaic resources going to be?" "Well, kind of anywhere and everywhere in San Diego County." "Where is the storage going to be? Where is the energy storage going to be?" So, this is where – it did not take me long, they hit me on the head with it a few times, but it did not take me long to figure out, okay, pervasive data coverage is what we need. We need to kind of just take location out of the equation, and I can, when we are finished with this, and we want to bring on a new energy asset anywhere in San Diego County, and I will be able to provide very very reliable communications to that asset, to

bring it up, and bring it online fast.

We have a Phase 2 that we proposed to our Board, that was not part of the ARRA proposal, or the Department of Energy grant proposal, and that is to spend approximately $30 million to take the same concept and do it in Southern California gas service territory, that is not what we are working on today and, frankly, I am waiting to – you see that thing in the middle – Southern California Gas AMI Network Strategies set, that is happening in real time, as we speak. My team and I are part of that decision and part of that strategy, and later on, if we can take the same concept and move it on to the gas grid, not just the electrical grid, it makes sense.

This is the funding summary, $20 million was our grant, we were nowhere near as ambitious as our brethren from SMUD, but this appeared to be about the right amount of money for a communications system. SDG&E is putting $34 million of capital and, like SMUD, we do not have a CEC agreement yet, it is pending, but that will be for a million dollars. And by the way, all the interactions with the CEC leading up to our proposal were just wonderful, were really great, and nothing but – it is one of the reasons I chose to come up here in person and really, you know, talk to you is that it was a great partnership, we learned a lot just from our interactions, so thank you for that. We are about ready

to sign our first major contract for suppliers, for the foundation services piece, that will be about 30 percent of the program. We got started right at the end of April with our signing of the DOE grant, which it feels weird for me to say "we got started" because I have been working on this for over two years, but we have initiated work on all program tracks and we are shovel-ready, we expect first production service in 2010, and we will complete before the middle of 2012.

Job creation is always a difficult thing, we try to be very conservative with whatever algorithm or assumptions that we come up with to decide our job creation statistics, but in any project of this size and, frankly, this one is a little unique because it is a communications system, that means the expertise for this project is fairly narrow, but we think there will be about 83 full-time positions, both in utility and suppliers, that are created and enabled over this two-plus year project.

In terms of environmental and other energy impacts, you know, frankly, we do not have very good metrics for this project, this was one of the things we struggled with in our discussions with the DOE, and we are talking to them about more appropriate metrics. You know, there is an argument to be made that we are going to make our mobile workforce and the trucks that we put on the road that much more efficient,

fewer trips, more efficient trips, less rerouting, ability to enable home starts, all kinds of efficiencies, but you know, I am frankly underwhelmed by that, and we are working with the DOE to come up with a better set of metrics that describe the environmental and energy impact.

What is next for us? We are like any other large program, having gotten the go ahead, we have to finish staffing, we are two months into our DOE oversight and reporting requirements, and that is going quite well. As I said, we are getting some key suppliers under contract, we are dotting the I's and crossing the T's on all of the engineering and requirements aspects, getting our new users used to the idea that this thing is coming. But we are doing all the things that you would expect any large program to do. We are also working more and more closely with our Smart Grid team. The way we were organized, the Information Technology Division supplies the computing and the communications to Smart Grid, which is viewed as more of an application for both the consumer and the utility, so we are an enabler.

On some of the discussion questions, you know, what would we have done differently? I think a couple of things. We had the strategy before the ARRA funds showed up, and we would have taken quite a bit longer to realize the strategy. I think in that regard, the Stimulus program, at least in

our little part of the world, had to be considered successful, because we are creating jobs, we are doing work, we are building and buying systems several years in advance of when we would likely have done it otherwise. I think the other thing that is very hard to quantify, I think the other thing that – I think there was a question from the Commission here about possible other exponential advances? Security is the thing that comes to mind. You can do all the theoretical security work you want, I have been doing IT work, security work for many many years, you do not really know what you are doing until you build things, until you construct things, and getting Smart Grid Communications substantiated, installed, and secured, getting us further along the security timeline faster, I think that is a huge benefit. We do not want to find that we have some fatal communications flaw 10 years from now, we want to find it now. We want to find it and fix it now, before these applications become widespread. And so, I think the notion of exponential advances, which really are hard to measure and more when we talk about explicitly, I think that is one of them.

As far as the California Energy Commission, you know, the question was what we would ask of you, I was very very pleased to hear about the stance you are going to take on reporting requirements, that will be helpful to us, as

well. And we really did not have much to recommend, I mean, this is, you know, adopt a coordinated grant application process, frankly, there was not time for that, you know, this thing just showed up on people's doorsteps, the ARRA Program, so we understand why that did not happen. If it ever happened again and you had notice, I suspect you would do that.

So that is really our story. We are excited to be moving, I certainly am. And I would be happy to answer any questions that the Commission or the audience has.

COMMISSIONER BYRON: Mr. Nichol [sic], thank you for being here this morning, I guess now it is this afternoon.

MR. NICHOLS: Yes.

COMMISSIONER BYRON: I heard a similar presentation by Dave Gier on San Diego's Smart Grid activities, the plan, and very progressive approaches here, I congratulate you in that regard. And you have already answered one of my two questions, and that is kind of really you were headed down this path anyhow, so how much did it accelerate your program, and you said several years in advance, perhaps, of where you were heading.

MR. NICHOLS: Yes, sir.

COMMISSIONER BYRON: And so that is really good to hear. The other is, how much applicability do you think this project might have to other utilities, particularly the

investor-owned in the state? The large utilities?

MR. NICHOLS: We actually think it has broad applicability. Every utility's requirements are a little bit distinct in that they have their unique geographies, they have their regional set of stakeholders, they have their regional set of priorities, and yet the mission is the same, you know, deliver energy to the ratepayers, to the consumers, at a reasonable price, and deliver it very very reliably. So, we think that this kind of strategy has great applicability. We have ongoing debates with the public carriers about the wisdom of building a private system vs. just using the public systems.

COMMISSIONER BYRON: Right.

MR. NICHOLS: And what I tell them each time is we have many many use cases, or applications, for which public carrier services are exactly the right solution. And we are purchasing those today and we will continue to purchase those. There are other applications for which the public communications carriers are not really able to satisfy certain requirements, it is just not reasonable for them. It is not reasonable for them to, at the moment, given the state of the technology, and the state of wireless systems in Southern California, it is not reasonable for them to guarantee they will recover 100 percent of our service territory, it is not possible, reasonable for them to cover

or to provide, you know, five to 10 megabits per second with 100 milliseconds of latency, you know, very very high performance where we need it and when we need it, and so on. So we seek to strike a balance with them. Given that, we think the approach and the solution is very applicable to similar utilities.

COMMISSIONER BYRON: Good.

COMMISSIONER EGGERT: I just wanted to – I guess a comment – I thought you were sort of spot on with respect to the fact that you are highlighting that this is really an enabling activity –

MR. NICHOLS: Yes, sir.

COMMISSIONER EGGERT: -- and that the significant potential for job creation and economic activity is probably going to be coming from the investments that will be enabled through this, the distributed generation, energy storage, electric vehicles, etc., and I think that is one of the challenges we face on a number of our programs, that they are sort of enabling our institutional, so setting up the infrastructure that allows for those other investments to be made. So, will you also be, as part of this project, tracking that other activity that this is enabling in terms of –

MR. NICHOLS: We are actually – it has come up – it has come up with the DOE as we are trying to find more

appropriate metrics to describe our somewhat unique project. The discussion has been around second order metrics, you know, so this is the foundation, this is the enabler, can you track far enough, you know, the applications that have been built on top of this, and track some of their benefits, and attribute their benefits to this initiative? I have been an IT infrastructure guy most of my career, I am very familiar with that kind of dilemma, I think it makes sense, but it will require that we keep some kind of tracking mechanism going beyond the confines of the program. So we are interested, we are willing, but we have not agreed yet on exactly what those tracking metrics might be, or how long you attract them for the future.

CHAIRMAN DOUGLAS: Just a brief comment. I am really pleased to hear about your program. I really had not had the opportunity to sit through a briefing in this level of detail, it is really interesting to me. This does sound like exactly the sort of thing we hoped ARRA would facilitate for California, shovel-ready projects, bringing real and lasting long term benefits to the state, transformational in scope, and I am really pleased to be able to get this federal cost share in investments that California wants to move forward with, that --

MR. NICHOLS: As were we.

CHAIRMAN DOUGLAS: -- are going to strengthen us,

and that we will be able to build on, and we will be able to take advantage of well into the future. So, thanks again. Thanks for being here.

MR. NICHOLS: You are very welcome. Thank you.

MS. KOROSEC: Do we have any questions from the audience? Anything online? All right, thank you very much.

MR. NICHOLS: Thank you.

MS. KOROSEC: With that, I would recommend that we break for lunch now. Our last speaker has graciously agreed to come in after lunch, so let's break and return at 1:20. Thank you very much.

(Off the record at 12:20 p.m.)

(Back on the record at 1:24 p.m.)

MS. KOROSEC: We will go ahead and get started again. We are going to start this afternoon with a presentation by Marcello Di Paolo from the Los Angeles Department of Water and Power. Marcello, go ahead, you are live via WebEx.

MR. DI PAOLO: Okay, hello everybody, hello Commission. I am going to do a quick rundown of what LADWP is doing for their Smart Grid Demonstration Grant, and how the CEC portion, or the PIER portion is associated with this project. Next slide, please.

So, basically, a quick background. In 2009, the DOE had the ARRA release, an opportunity for a workers Smart

Grid. DWP was awarded a $50 million grant, which was basically, we did it with a partnership with three entities, we partnered with USC, UCLA, and JPL. Next slide.

Basically, oh, we can skip that, it is just our general org chart we have our different Executive Committees. Next slide. We have a Program Steering Committee that oversees everything, next slide, and we have a Smart Grid Program that is basically divided into five subcomponents, we have a Program Management Office that oversees the entire project, we have a demand response project, an electric vehicle project, cyber security project, and a customer behavior project. And all four of these projects are basically interrelated and integrated with each other. Next slide. So, PEPMO, basically it is a standard management office. In that office, we are going to be doing everything from all the management of the work, definition of architecture, requirements, testing, all the reporting, and all that jazz, and all the project management portion of the project will be done there. Next slide.

Demand Response. In demand response, basically what we are going to do is use AMI Communications, Smart Meter deployment, and apply DR, so we are going to work with our partners at USC and UCLA to develop high tech demand response protocols, as well as systems that we can control at these little micro-grids that we are going to develop at

both the University of Southern California and the University of California at Los Angeles. We are going to try and experiment with different HAM networks, different AMI networks, and most importantly, we are going to use the campus test pads for demonstrations to really see how the customer and how the utility can quickly react on a demand response. Next slide.

On this slide here, I list a couple of things that we are going to demonstrate as part of this project. We are going to demonstrate controls, monitoring, we are going to demonstrate production of megawatts for short duration, and how we can reduce megawatts, or increase if needed. We are going to do voltage regulation, we are going to demonstrate, bring in a meter data management system, we are going to play with different customer functions in billing and try TOU, maybe do some dynamic billing, we are going to demonstrate some new Website capabilities, you know, a huge part of demand response is getting the consumer involved, so we are going to do some Web redesign where the consumer can see more information. We are going to do a little bit of an increase into our outage management system, where once these meters start calling home, instantly tying it to our outage management system where we already have all of our circuits, our GO-coded map, so we can instantly see where outages are. We are going to basically demonstrate some outage management

and also demonstrate some distribution automation on some of our circuits. Next slide, please.

For Electric Vehicles, here we are going to use AMI Communications and various other RTU and remote telemetry to work with EVs. And with Electric Vehicles, what we are going to do is we are going to focus on Smart Charging, we are going to work on battery aggregation and backfilling, we are going to also create a fully operational micro-grid and we are also going to work on using these EVs as renewables because, quite frankly, these are going to be mobile batteries, so see how we can use these as immobile battery. And lastly, we are going to take advantage of certain existing cost share programs that both USC and UCLA have, put EV infrastructure in place, and start seeing how we can affect the community and see how these cars can actually impact us as they are being used. Next slide, please.

So some of the things that we are going to demonstrate on EVs will be like monitoring of all chargers. We are going to install about some 600-700 chargers throughout Los Angeles. So, we are going to be able to monitor and meet all of the megawatts, demonstrate control of the charges, like, for instance, if it is a peak hour and our customers agree to that, or actually contract for this program, we will be able to send like a command saying "don't charge right now" or "charge later" or to start doing

different types of charging ideas like where, say you have to charge your car, you have four hours that you need to charge your car in, but you only need two hours charging time, your transformers are kind of overloaded, can you a cycling where you charge for 10 minutes on, 10 minutes off, 10 minutes on, so it is not a constant, you know, we are going to try different experimental things. We are going to try doing various – how do I best say this – integration of BCVs and see how they truly impact the grid. We are going to basically see, what kind of harmonics are there? What kind of effect are they going to have on the grid if we install a bunch of these on one feeder, one section? How – you know, there is a lot of EV research that needs to be determined to see what the true impact is. And, also, another great thing with this is, we are going to do a lot of modeling where we will do a lot of load forecasting, a lot of studies to see what the true impact of EVs will be in the future. Next slide.

We are also going to do some next generation type of security research where we are going to do demonstrations with grid resilience, testing, and finding a way to redefine what our security parameters are. Next slide.

So what are we going to demonstrate on this? This, by far, if you look at it through a techie point of view, is probably going to be one of the funnest ones where you are

going to have hackers that are going to try and hack in constantly through our AMI system, through our firewalls, through the various things that we are going to salvage, and try to develop a new secured network for us. So, we are going to look at doing various planting of viruses, seeing if people can see if we can detect an intrusion, or if we can even intrude, we are going to basically do monitoring of networks. We are going to do logging out activities, we are going to try and see if we can demo pattern recognitions and see where certain things are done, and there are going to be lots of studies where, here at JPL, is going to use a lot of their brains basically to actually monitor and try to come up with new ways to make us more secure. Next slide, please.

So, some of the behavior studies, I think this is probably one of the more interesting parts where, at the end of the day, whether you do demand response, AMI, Smart Grid, or whatever, the customer is a huge factor, so what we are going to do is we are going to bring the customer on board and we are going to do a lot of outreach during our DR, we are going to measure and track, based on attitudes, based on EV, and to see what the true impact is going to be, and also, with university test pads and the surrounding areas, to see how the community really is going to respond as AMI comes on board, or as DR is used. Next slide.

So, some of the things that we will demonstrate and be able to show, for instance, we are going to be able to demonstrate customer use patterns, customer usage data, utility behavior, customer savings, and a couple other ideas like demonstrate failures and successes, we are going to demonstrate customer pattern of communication, and also a private business one is we are going to be able to see what customers' reactions truly are to demand response, or also on Electric Vehicles, see how much we can get away at the utility with the customers, like will we be able to tell a customer, "Hey, your car requires – you have eight hours until you have to use your car, we choose when you can charge it, you just plug it in at home, you push a button, and say in eight hours fully charge it, I do not care, all I need is three hours of charging, utility, you pick when to charge my car." We are going to try different things like this and see how people react to it. Next slide.

So, basically on expenditures, we are going to spend close to $45 million on demand response, $35 million on electric vehicles, $15 on Cyber Security, and $11 on Consumer Behavior. Next slide. And the $1 million that we are going to use from the PIER funding is going to be truly dedicated to this one circuit were we are going to try and do a distribution automation AMI circuit of the future, which will be part of a little micro-grid that we are going

to create to help us actually study and see how it is going to impact DWP. We are going to do purchase distribution automation, we are going to do cap control, we are going to do monitoring of transformers, whether it be overhead, underground, or pad-mount. We are going to install a bunch of charging stations for EVs where we are going to be able to back feed and use them as mobile battery supply. At the same time, we are going to have a live circuit with live customers and cars where we are going to be able to do grid impact and stability studies. We are also going to try various distribution automation technologies using various wireless communications to see what the best map is and seeing if there is a way in which we can overlay our distribution automation with our AMI infrastructure. Next slide.

We are basically going to demonstrate a few things, just remote operation, autonomous operations, and see how we can truly improve power factors. What we are going to do is we are going to basically, on this circuit, we are going to integrate and automate everything from the generation station all the way down to a [inaudible] distribution station and a feeder, so basically we will be able to see how the feeder reacts, how the substation reacts, the switching station, receiving station, and generation station. Next slide.

And with the transformers, we are going to do various [inaudible] and see what the effects on the transforming are? You know, you are going to put this car online, an EV, [inaudible], well, you know there is going to be a load increase, but how much of an impact is there going to be? How much heating is that transformer going to see? [Inaudible] constantly control that car, and at the same time not affect the transformer as much, these devices will help us see it. Next slide.

For renewables and battery integration, quite frankly, every utility has an RPS goal; now, one of the things that you always try to plan is ways to meet your RPS goals and find creative ways of doing it. Building power plants are expensive, but you know, when you start looking at community storage, an EV can be a great battery. Now, this will require some more work and investment in the future for the utility, but the idea is, if we ever choose to maybe buy the battery directly from the car manufacturers, do we choose in the future to lease them to consumers? That way, the utility can control them, [inaudible] to actually charge, discharge, we see them as portable batteries, like a Nissan Leaf can come with a 3.3 kilowatt battery, that will actually replace 25 kva [inaudible] for a few hours. That is a good deal for us. So we are going to do some research on that and see how we

can cycle batteries, how we can aggregate these batteries, and also we are going to try and demonstrate – it is sort of like a garage of the future where we are going to install some solar plants, a car charger, we have our normal lines and we will see if you can put any other renewable on this circuit and see how we can intelligently control the power and how we can play with various technologies. Next slide, please.

For Grid impact study and power study, this is kind of interesting. We actually have – USC is going to be dedicating the head of their power system in their EV program, the head of power, is this one professor by the name of T.C. James. He is dedicating himself for five years to this program, and all he is going to do is power studies, [inaudible] studies, modeling of the power grid, and he is going to look at how EVs are going to truly impact DWP and part of WECC. So what he is going to do is basically – I have already showed him like – we actually heard when Obama ran for President, one of the big things he said was, by 2015 he wanted to see a million Electric Vehicles in the U.S., he is really big into electrocution of cars. Our Mayor wants to make L.A. the EV capital of the world. So when you look at a million cars coming to the U.S. by 2015, it is pretty fair to guess 10 percent of those cars will be in California, a large percentage will be in Southern

California. So, to better prepare for this, we are going to be doing various studies and models showing how EVs impact generation, transmission, distribution, and study what various loading scenarios could happen. We already have an electric model on DWP of all of our circuits, so we are going to integrate some software and study and see, okay, if clusters come, which areas will be impacted the most? How will it impact the grid? Can we still maintain the liability by Smart Charging or intelligently controlling these chargers so that, if three people off the distribution transformer come home at the same time, will that blow up a transformer? Things like that will be done in this study. Next slide.

And for distribution automation, we are going to basically be playing with everything from 35 KB automation equipment, industrial station equipment, [inaudible] KB, distribution equipment where we are going to monitor faults, we are going to do transformer monitoring, we are going to do local energy storage integration, we will do remote switching, cap control, smart control. Next slide.

And for AMI, we are going to install, well we will probably during this project probably install three or four and maybe up to six various meters from different manufacturers to evaluate which ones work, and what we are probably going to do is to just evaluate which really works,

what is the best way to [inaudible], and we are going to try to demonstrate two-way communication, remote on/off, demo fault monitoring, demo voltage demand, bar read, you know, everything that they show that AMI can do, but what we are going to try to do is integrate the solution and, most importantly, we are going to create a control center just for this grant, where everything will go in there and we will start figuring out how do you truly integrate all of the data that comes in from Smart Grid, and how do you use it? And that is pretty much it for – next slide – that is pretty much what L.A. is doing with this grant.

MS. KOROSEC: All right, do we have any questions from the Commissioners?

COMMISSIONER BYRON: Yes. Thank you, Mr. Di Paolo. This is Commissioner Byron. And I was not very familiar with the LADWP project until now, and this is an extremely aggressive project, you are trying to accomplish a lot of things, but before I ask maybe one or two questions in terms of scope, let me ask you this. I am trying to piece together the financing of all of this and you may have been vague intentionally, but page 1 indicates there is a $60 million ARRA Smart Grid Grant, and then I am looking at page 8, my slides are not numbered, so it is probably about Slide 15 or so, it shows the Smart Grid Program expenditure, and it shows a total of $120 million.

MR. DI PAOLO: Right. Well, the way it works is the DOE Grant for – the Smart Grid Demo Grant that we were awarded has a 50 percent cost share, so we were awarded a $60 million grant and DWP is basically going to have to match it.

COMMISSIONER BYRON: Gotcha.

MR. DI PAOLO: Since we have two university partners, the way that it is working is, USC – the complete breakdown is, okay, let me be exact on this, USC is going to give $20 million worth of activity -- $10 million for their match and $10 million they are getting from the DOE; UCLA is doing the same thing, $10 million match and $10 million that came from the DOE; JPL is a Federally funded Research & Development Center, they cannot really match the money, so DWP is going to pay for their match, we are going to give $3 million, and then the Grant will give $3 million, and the remaining money is about $74 million worth of activity. Half of that will be matched and the other half will be government.

COMMISSIONER BYRON: Okay, good –

MR. DI PAOLO: When we look at $120 million, we have $120 million worth of work, $60 million of our own money, per se, well, $40 million is DWP money, $10 million USC, $10 million UCLA, and the other $60 is from the Federal Government. The $1 million of the CEC PIER Grant that we are receiving, we are going to use to fund this Micro-Grid

that is going to be created to support the work that is going to be done.

COMMISSIONER BYRON: Good. All right, well, thank you very much, that is very helpful to understand that and I appreciate you breaking that down. This is obviously a very substantial project for you. Let me ask you a similar question I asked earlier, does this advance your plans in any significant way? And maybe the answer might be in terms of the number of years that this might accelerate your program?

MR. DI PAOLO: Well, if you look at the research that is going to be done in Cyber Security, yes, absolutely. That is going to benefit us greatly. On Electric Vehicles, that is going to have a huge benefit, as well as Demand Response. What we are right now in the process of, we have a plan in place to actually come up with a business plan on a Smart Grid architecture for a long term plan at DWP, and we are hoping that what we get out of this demonstration grant, we will be able to leverage and include to actually facilitate when we are doing our long term investment. So ideally, yes, it should accelerate it, but one of the things that also we are waiting on completion of this Business Plan that we are creating to help us figure out where the quickest return on the investment is. We are a Municipal utility, we really cannot go to the PUC, do a huge capital

investment, and say we want to increase our rates, we need to make a lot of our decisions based on return on investments so that we really do not have to go to our City Council and say we want to increase our rates. We want to try and stay relatively at the same rate and be able to get a huge return for what we invest in.

COMMISSIONER BYRON: Oh, do not be afraid of going to your City Council and asking for rate increases.

MR. DI PAOLO: You have not watched the news lately, have you?

COMMISSIONER BYRON: I have. Two quick questions. Have you been talking with SMUD and their project, any coordination of value?

MR. DI PAOLO: Not as much with SMUD. I am an active member of -- SCPPA in Southern California has a Smart Grid Ad Hoc Committee where you have people from Glendale, people from Burbank, Anaheim, and we have meetings where we are talking about the projects that are going on within Southern California, but with SMUD? Not really.

COMMISSIONER BYRON: All right, well, it is just something that I suppose that Commissioners ask often when we have to coordinate research activities. We would not require that, of course, but if there is some benefit to it, we certainly encourage it. One last quick question if I may, this is clearly an enormous program, emphasis on the

utility information and control of your grid and your system, and I think you are going to learn a tremendous amount, and I hope it is extremely helpful to you. I was interested, as I looked through this, on the customer benefits, you have sociological and behavioral studies that you are going to do, let me ask it this way: what is in it for the customer? Have you been able to think through how you are going to communicate benefits to the customer? Because, as I look through this, I really do not see any of that listed in here.

MR. Di PAOLO: Well, some of the things – since right now we are just in the process of beginning our design phase of this project, what we are looking at is possibly doing building designs, website redesigns where more information is easily conveyed to a consumer, in which, okay, when you get an electric bill at the end of the month, or at the end of every other month, all you see is something – a number, and then a term called "Kilowatt hour." Unless you are an electrical engineer, or you work in the utility industry, a lot of people cannot correlate what a kilowatt hour is, or how much consumption it is. So, by creating interactive websites or interactive things that the consumer can easily see, creating a Blackberry application that tells you, "Hey, guess what? Right now, because you have your air-conditioner, your computer, and your plasma TV on, you

are paying a dollar a minute." "I want to turn this off to drop down to $.50 a minute." You know, things like that are stuff that we are going to create and we are going to use the University test-pads as areas where we can quickly get information to consumers, we can quickly see how it works, and we are also going to look at large industrial customers and how we can – if we have these large customers there who are on demand meters that are built on total consumption, there are ways that we can give them more information, that they can say, "Hey, if I turn off my power for a little bit today, I will save X many dollars." Is that enough of a way to get a customer influenced demand response and be able to save on the amount of power we have to generate, and then, at the same time for the customer, allow them to save on how much electricity they use? So, we are going to do the studies in that, and hopefully by using the various test-pads that we are going to create, we will be able to gather a ton of information from actual real customers.

COMMISSIONER BYRON: All right, well, thank you. Good luck with your project.

MR. DI PAOLO: Thank you.

COMMISSIONER EGGERT: This is Commissioner Eggert, and thank you for being here with us today through the WebEx, saving some travel costs and emissions by staying in your office. The proposal that you have here with respect

to the EV, a portion of the study seems quite substantial and ambitious, and comprehensive. I guess, is this going to be linked through the expanded ETEC deployment activities?

MR. DI PAOLO: Yes, we are going to look at the ETEC stuff, but the ETEC Program is going to do some of that, it is going to be done in parallel with us. We might choose to leverage some of the ETEC stuff and research it and learn from it, but quite frankly, the way that this project started and we planned everything, it was prior to even knowing about ETEC, but we might use some of their chargers, we might use some of their technology, but the goal is, it is a demonstration grant, it is research and development, it would be a shame to have entities like JPL, USC, and UCLA involved, and not allow them to research and look at other technologies that are available, as well. So, we are going to look at ETEC, but we are also going to look at whatever else is available and see if even – I think UCLA is going to be demonstrating their Wind Smart technology that they developed, which is an open program that everyone can use, we are going to evaluate their product, as well, and see what really is the best solution for us, as well as for other people.

COMMISSIONER EGGERT: Okay, that is helpful. And then, in terms of your sort of battery analysis, whether it is cycle charging, or battery aggregation, do you have any

sort of current partnerships that you are pursuing along those lines with any of the automakers or battery manufacturers?

MR. DI PAOLO: Well, right now, we have done some preliminary talks with various – it is kind of interesting – every manufacturer wants to get involved, but we have only gotten commitments from one, and that was actually with BMW and their Mini Cooper. They are actually going to be doing something special, they are going to give us a lease of one of their vehicles at a very decent rate, and allow us – and they are going to modify it so that we can actually aggregate it in and use it for back feeding. So, it is one of these things that we are talking with the manufacturers, but a lot of these car manufacturers are kind of hesitant to say, "Yes, please do it," because the second you start cycling a battery, you reduce the life of a battery, and they do not want it because DWP doing that, they would get a bad reputation for their vehicles and their battery life. So, the manufacturers have some concerns, but we are talking with everyone and our plan is to talk to every manufacturer and see who will allow us to do it. In the event they do not allow us, we might modify it ourselves and see how it works. But we do not want to put the car manufacturer in a situation where we modify their car, we use it, and then the battery life is one year, and they get a reputation of

providing a bad Electric Vehicle, we do not want to do that.

COMMISSIONER EGGERT: So, again, I appreciate the response. And I guess maybe my last would be a comment along the lines of Commissioner Byron's comment, which is that we are actively involved in quite a number of research initiatives in looking at these activities, including through the PIER Program, and hopefully you are able to connect through those activities that are going on, I think, including at UCLA, but also at some of the other universities, as well.

MR. DI PAOLO: Definitely.

CHAIRMAN DOUGLAS: This is Chairman Douglas. Just a brief comment. Thank you for making this presentation, it has been very interesting to all of us and, as Commissioner Byron said, this is – the scope of this project is definitely very far ranging. You did not talk much about reporting and one of the presenters this morning from SMUD certainly did, and exhibited some concern about that, is it your expectation based on what you heard, as well, that DWP would report to the Energy Commission – and I could ask this of Energy Commission staff, as well – basically what you would submit to the Federal Government on the entire project?

MR. DI PAOLO: On anything that we submit electronically, whoever the contact is, they will be cc'd on

it, and that is not even an issue. And even better, you know, I like to talk a lot, I am guilty of talking, and if ever anyone wants to come down from the CEC down to Los Angeles, I will gladly demonstrate, I will arrange people to be there from the various components, heck, the university people are more than willing to have some of our partners to actually show what they are doing. So we will be glad to talk, speak, write. One of the great things with partnering with the Universities and JPL, one of the things with this demonstration grant, is that the DOE wants publications, they want information to come out. By having a bunch of PhD. Professors and their grad students working on this with us, these are people that are trying to finish their dissertations, they are required to publish papers, so we are going to be publishing as much information on our research, of what we learned, and what does not work, we are not going to be negative in what we write, we are just going to be talking about successes and so forth, so we are definitely going to be beyond open, and quite frankly, I totally expect an open door policy where, if ever the CEC wants to come down and visit, you are more than welcome.

CHAIRMAN DOUGLAS: Well, that is great. Thanks very much. We appreciate that and good luck with your project.

MR. DI PAOLO: Thank you.

MS. KOROSEC: All right, do we have any questions

from those in the room? Anything on WebEx? All right, then I think we will go ahead and move on to Percy Haralson from Southern California Edison.

MR. HARALSON: Hi, I am Percy Haralson, I am with Southern California Edison, and actually the Manager of Field Technologies in our Advanced Technology Organization. And I am going to go ahead and talk to you about our ARRA projects that we have. We actually have three projects, and I am going to talk about all three of them.

Okay, the first one I am going to talk about is our Irvine Smart Grid Demonstration Project. The Irvine Smart Grid Demonstration Project is actually a project that is based on making a vertical cut through all different technologies with Smart Grid technologies, that we believe are instrumental in making the Smart Grid come to life. As you can see from this project size, about $80.2 million, $40 million of that is DOE requested. We have a partner share of $12.2 million. We have SCE contribution of $27.9 million, and then PIER funding request of $1 million. The objectives of the Irvine Smart Grid Demonstration Project, we have a number of them; one is that we want to go ahead and look at energy smart customer devices, so we are looking at a number of – kind of think of it as different times of efficiencies of homes. We are looking at homes in the current year, right now, so basically untouched. We look at

homes that are just a few years out, looking at some energy efficiency gains, you know, made to the structures. And then we are looking at all the way to the Z&E [phonetic] homes for 2020, and saying, "What is that going to look like? And how are these going to affect the grid?"

We are also looking at plug-in Electric Vehicles, and we all know that plug-in Electric Vehicles can represent a huge increase in load to the distribution system, so we are going to be looking at what those impacts are and how that communication is going to work that. We are also looking at integration of solar, both DG, so Distributed Energy Resources, we are looking at incorporating battery storage, battery storage in multiple locations, so it would be battery storage within the home, battery storage within the community, and battery storage and large battery storage, actually, in our case, it is a mobile storage unit, but a much larger one that could be used in the substation.

We are looking at energy efficiency on the distribution grid, itself, by looking at a regulated volt bar control system where you go ahead and try to optimize the distribution at your distribution line, so that you can keep your voltage as low as possible, but still within the regulatory requirements and for the customer.

We are looking at self-healing, incorporating the self-healing grid. Southern California Edison has one of

the largest distribution automation systems in the U.S., but it has its limitations, and the limitations it has is that, if we had a fault on one of our circuits, the system takes the entire circuit out, then goes through its algorithm of determining where the fault is, and then restoration. It is a fairly slow process. What we are looking at doing in this case is building a loop type circuit, a different topography than we would normally use, along with multiple fault interrupters with high-speed wireless connections between them, so that only the section that would have a fault on it would be disturbed and the rest of your customers would not be disturbed. Wireless is the key concept to that, too.

We are looking at not only wireless communications for our distribution devices, we do that today, but high speed wireless that is actually within the realm of protection communication speeds, which we have actually done in an earlier project using fiber optic cable, so the key is, how do you go ahead and bring the speed up fast enough in a wireless technology to actually meet the requirements that we had within our fiber system.

We have another project, too, it is a super conducting transformer, and I will talk about that a little bit later, it just happens to be integrated with the ISGD, we go in the same substation.

And then secure energy network; now, there is

nothing without security, and I think we have heard that over and over again, without security for the next generation, you really do not have an operable communications system for the Smart Grid, so we are going to be looking at end-to-end security, all the way from control systems, through the substation, through the wireless systems, through the device in field, and then also workforce of the future. So, we are also looking at, what is the impact of Smart Grid to the work force? And what type of education curriculum has to be put together, then, to go ahead and meet that requirement for the future?

Our sub-recipients that we have, we have GE, USC, and then we have our vendor list, too, UC, Boeing, GE, EPRI, Itron, SunPower, UC Irvine, a couple at Pomona, Cal State University Los Angeles, A123, so working with a number of universities as a part of this project.

This is actually a map of our project. So you can see the technologies that are involved in it. It includes all the pieces that I talked about before, including solar charting for EVs, and also battery storage technology with the EV charging, so that you can go ahead and actually change from the time you collect the energy to the time you actually dispense it to the car. You can see the different groups of homes that we are going to be implementing and the different styles of integration of equipment. Part of the

equipment that you are also going to see in these homes, too, for the consumer side, is intelligent home appliances, also. So, it is not just a matter of giving somebody PCT and, you know, a [inaudible] [34:36] communicating thermostat, or an in-home device, an in-home display device, but actually incorporating some of the newest technologies of advanced dryers, washing machines, refrigeration, and things like that, too, and those devices are able to go ahead and respond to demand response signals.

The second project I want to talk about is our Tehachapi Storage Project, and this is actually a storage project associated with our Tehachapi Wind Generation System. Again, what we are looking for here is actually a number of goals that we have for this project. You can see the size of it, $57.3 million, DOE request of $25 million, partnership cost share of $6.3 million, and then SCE contribution of $26 million, along with the $1 million funding request from PIER for this project. This is actually what we are trying to do for the Tehachapi Storage Project. We want to go ahead and we are going to be using a lithium-ion storage system, it is actually the largest lithium-ion storage system that has been produced and used on the grid. It is an 8 megawatt hour, four-hour battery system, it is very large, it is about an 8,000-square-foot facility that it is going into, pretty good size, yeah. It

is a lot of laptop hours. And this is being produced by A123, and again, all of the data from this will be shared with all the different organizations. We have a measurement and verification plan, we have 13 use cases that we are going to be trying this out for, so it is a matter of looking at it for transmission uses, system uses, and ISO market uses. It is everything from voltage and grid stabilization through capacity resource adequacy, shifting of wind generation outputs, frequency regulation, which is actually – frequency regulation is actually one of the things this technology has been used for in the past, and then we are also seeing how it can go ahead and be used for ramp-up and ramp-down, also, to make wind a much more dispatchable energy source. Again, our sub-recipients are A123, lithium-ion battery technology, you will see A123 throughout these projects, and for the battery technology that we are using. Vendors are Cal Poly Pomona and Quanta Energy, and then we have an advisory group that is made up of a number of different organizations.

This is an artist's conception of the facility, again, a pretty good size, this is going to go at our modeling substation, you know, it is one of those things, when we were first thinking about it, we were thinking trailers, right? And then as we realized it, trailers are not going to work, this is much bigger than we thought,

originally. And then, what it finally came out to is this 8,000-square-foot facility.

And then we also have our Waukesha electric systems, this is our superconducting transformer. Now, in this one, it is not actually our work, we are a cost-share contributor, which means we are really creating the location for it to be tested, we would take care of the integration into our substation, and then also take data collection for it, and allow the distribution system to be used and for it to go ahead and drive the distribution systems that we can go ahead and take the data for it. You know, obviously, the advantage that we have in this is the ability of really combining together a fault current limiter and a transformer, all-in-one. So, if a fault occurs, then the transformer automatically will be driven out of superconducting and it will current limit that, so it will automatically current limit. The other advantage, too, is this is obviously much more efficient, too, it is a transformer when it is not having to current limit. And, again, for the project size of this, you can see $21.7 million, and a request of $10.7 million from DOE, and a partner contribution of $10.2 million, and SCE's contribution of $.8 million, and then PIER funding of $755,874, that is pretty amazing, we got down to a dollar there.

And this is to give you a little bit of background on the fault current limiting superconducting transformer. It has a lot of advantages. As I said, one advantage is that it is automatically a fault current limiter on its own, the other advantage is that it is much smaller than a typical transformer. This would be a – I believe it is a 28 MVA transformer, which is typical for our distribution substations, but a much smaller size, and more efficient. Our partners team for this is Waukesha Electric Systems, a super powered tech center for super connectivity at the University of Houston, and the Oakridge National Laboratories and, of course, Southern California Edison.

The expected outcomes from these projects, we have a number of expected outcomes, we are going to be going through and quantifying what the values are, the benefits of each of these different technologies, and how these technologies -- more importantly, how these technologies work together. We are finding out what the scalability is going to be of each of the technologies. We will also be looking for the Tehachapi wind energy storage project where we went through a number of different outcomes that we are looking for on it, but its biggest value is to allow us to be able to increase the amount of wind generation that we can actually put on our system in order to be able to go ahead and have an intermittent resource. But, increased

intermittent resource, but still have a reliable solid grid, it is there to be able to go ahead with one of the uses, is to fill in those gaps between when the wind blows and when wind does not blow, and when you get a gust, and when you do not get a gust, back and forth, and then it also has a number of uses, then, too, including transmission efficiency, too. And then our Waukesha Electric Systems, too, and this is for our super conducting transformer, to be able to take the super conducting transformer and find out what its limits really are, and what the value of the technology is, and how well it actually works. The other – the biggest value, really, of all these projects is to be able to push the envelope on the technology and be able to accelerate that so that these technologies can then be reliable for all the utilities to be able to start using.

Lessons learned from the process – this has been really exciting, you know, we started out originally and I think one of the earlier speakers had mentioned how well – it just kind of like showed up on a desk, you know, one day, and then everybody kind of ran with it. You know, I think that is the way it probably worked for everyone, so, it was a very steep learning curve for all of us. As we started getting into it, we realized that there was a lot more to this than we thought. We started realizing there is tax implications of the award, we had to go through and try to

figure out, what does that mean to the utility? What does it mean to our customers? And get that worked out. The Davis-Bacon Act compliance, this had to do with things all the way down to, well, you need to be able to go ahead and handle your payroll on a weekly basis. Well, we do not pay on a weekly basis, that is not the way the company works, and it is not the way our systems are set up, so that created issues for us and all the way through the company. Property ownership and disposition issues, that was something that we had not really thought about before, too, as far as now, for one of the first times, we are putting equipment out on our distribution system, including switching equipment now, that is theoretically partly owned by the U.S. Government, instead, so they are not necessarily fire accessed, then, so how do you work that out? At the end, there is also disposition of it, how do you retire this equipment in the end? And that took a lot of months. Property encumbrances, we had issues with that and we started looking at financing, our normal project financing, and we realized that DOE was basically going to be the first name on the list for the financing, which we cannot have either, for a utility. So, that took a while to work through that.

As far as looking for the issues that we ran into, one of them was the structure of the application. If you

look at Federal mandates and state mandates, they are a little bit different, and the way that the applications work are different. And one of the things that I think we saw, and I think you heard from a number of the different presenters today, is really a question of harmonization – is there a way that we can harmonize the processes that CEC uses and what DOE uses so that we can be consistent, then, between the two of them, one of them being, of course, reporting. I think I heard this morning, oh, that problem is already taken care of, so you were looking for exactly the same reporting as DOE does. That is a huge relief for us, that makes it much simpler. So that is really the same thing as everyone else has said, I think.

Next steps. Okay, final PIER funding, you know, documents require that we "definitize" – I love that word. I do not think that is a word, but somehow *undefinitize* became our first new word that we did not know about, we thought about that about six months ago, and then afterwards you have *definitize* agreements. And we finally have an agreement. It has been exciting for us. As soon as we have that signed, we are actually in the midst of that right now, all the paperwork has been turned in, all of the issues, we believe, have been resolved now, and we expect to have everything signed by the end of July. We have all of our partners lined up, everybody is all ready to go, so it is

really literally just a matter of getting our signature with DOE, then, getting that taken care of. And then Waukesha Electric, it is the same issue there, they also are in the same position we are in that they are going through trying to get their definitize award taken care of also, and working through all their – it is really the same issues, different company, that is all, trying to do the same thing. And as soon as that happens, then we will be passing it all along to you guys. And I think that is it.

COMMISSIONER BYRON: This is great. Mr. Haralson, my recollection is, in dealing with investor-owned utilities years ago, doing research at the Electric Power Research Institute, whenever we talked about government funding, the utility would run in the other direction.

MR. HARALSON: Well, it is fear. In all sincerity, it is because of these issues, the issues of who owns what and how do you go ahead and close down the project at the end and decide, you know, you take all the widgets and do we give them back, or do we get paid to remove them, or do we have to remove them ourselves –

COMMISSIONER BYRON: And I suspect that is why you do not have a definitized agreement yet!

MR. HARALSON: Yes!

COMMISSIONER BYRON: Is this a first for SCE and the Department of Energy?

MR. HARALSON: Actually, it is. Yeah, we have always had smaller projects that have been much simpler, but in the case of this one, this was really the first time we have had anything of this size and kind of the full ARRA issues.

COMMISSIONER BYRON: Well, and I am somewhat familiar with this proposal – I should say these proposals, as well, when they went in, my hats off to SCE and being able and willing to work with both Federal and State Governments in order to get this funding. Similar questions I have asked in the past, does this accelerate your plans?

MR. HARALSON: Absolutely, yes.

COMMISSIONER BYRON: And, you know, there is not a whole lot of PIER co-funding in this, we try to be very equitable and do you have any sense, Mr. Haralson, do you think having the state co-funding helps you in winning these awards?

MR. HARALSON: Yes, I think it does.

COMMISSIONER BYRON: Or are you just being kind?

MR. HARALSON: No, I mean that sincerely. It is a matter of showing the Federal Government that the State is also with us, and that there is consistency. I think if our company would just go out on our own without that, you know, it is just an independent corporation now, you know, saying that they are going to do this. By having CEC, or by having

the State with us, it gives us, I think, a tremendous amount of clout and shows that you believe that we can do it, too.

COMMISSIONER BYRON: That is great. And one last thing, I guess more a comment than anything else, we do have an ulterior motive, though, in providing our co-funding, and it is not your reporting so much as making sure that we transfer this information, this technology throughout the State so that other utilities get the benefit of the work that you are doing, you know, it is public research, and so I know – I can tell we are hearing from the Project Managers today because they do not want to do the reporting, but we are very interested –

MR. HARALSON: It is so painful – the work is fun.

COMMISSIONER BYRON: I really like the SMUD recommendation to make sure that we do require a final report because we want to make sure this information is disseminated to other utilities that can benefit from it.

MR. HARALSON: Yes, yes, and we will. We will have a final report. All the information that we gather is part of the DOE contract, you know, for this work, will be released to everyone. Just like, I think, as you heard earlier, everybody on the cc list, everyone is going to get it, so that will not be an issue.

COMMISSIONER BYRON: Well, excellent projects. I appreciate so much your being here to share them with us.

Very positive feedback in terms of our contribution to this, and welcome to the Brave New World of working for the Federal Government's funds. We will see if you are quite as happy at the end of the project with having received these funds.

MR. HARALSON: Well, thank you for the opportunity.

COMMISSIONER BYRON: Thank you for being here.

MR. HARALSON: Thank you.

COMMISSIONER EGGERT: Actually, a couple follow-up questions. Actually, it relates in terms of some of these technologies that you are testing at the TSP and the FCL, fault current limiting super transformer, do you see that if these projects are successful in this demonstration that the next step is to proliferate them across the system? Or where do you see them?

MR. HARALSON: You know, I think you have to look at each technology individually. Some of the technologies are more on the edge of the curve, right, than the other ones are. A good example would be our high-speed protection system that we have for our loop circuit, that is a technology that I think has tremendous value, and I think this project is going to show that, and it is going to allow it to come to fruition much quicker than it would have otherwise; along with that is the high-speed communications that has to go along with it, again, that is another one of

those technologies that everything is close to being able to do it, but not quite there, and I think this project is going to be able to give that extra little push to get the communications to the point where it is there. So those would be my examples.

COMMISSIONER EGGERT: And then, this is more of a curiosity. In terms of the battery storage system, what led you to choose the lithium-ion technology, particularly A123, did you look at others like sodium flow batteries?

MR. HARALSON: Yes. The big advantage of lithium-ion to us was that it is a known technology, it is a very high density, it is available on the market, there is a large amount of experience with it, granted, in much smaller applications, but it leverages those smaller applications that are used all over the world for a larger application. The other reason for it, too, is that lithium-ion is the battery source, or the battery technology that is the most likely for EVs, and Southern California Edison believes that we have tremendous synergy between the EV market and the utility market, or the power grid market, that those two - it is kind of like either one of them, on their own, is good in that there is a fair amount of sales there, you know, that could help push the technology to market, but the two together is much stronger than that for both, for both sides. And I know that you know that we are a big believer

in Electric Vehicle transportation and we are one of the few utilities that actually has had an electric vehicle transportation group for the last 17 years, it is something we truly believe in, and we continue to believe in.

COMMISSIONER EGGERT: Thank you very much.

MR. HARALSON: You are welcome.

CHAIRMAN DOUGLAS: Thank you.

MS. KOROSEC: Are there questions from the audience? Anything on line, Lynette? Thank you.

MR. HARALSON: Thank you.

MS. KOROSEC: All right, I would like to introduce Tammy Candelario from Primus Power.

MS. CANDELARIO: Don't they call this the "dead zone" in terms of giving presentations in the afternoon when everybody's digestion is at its peak level? So I will work on my monotone, but really glad to be able to come and talk to you today about our project. I am Tammy Candelario with Primus Power. Primus is a small battery start-up in Alameda. Primus was the brain child of the founder, Rick Winter, who spent a lot of his career working in various battery technologies. He spent time at PG&E and has a long history with battery development. In probably September, Primus started hiring employees and work began in earnest and has been going on since the fourth quarter of last year, and we are up to about 20 employees at this point in our

life as a company.

I am going to talk about the things that everybody else has talked about today, so I will just whip through that slide. So what we are really trying to do is develop, integrate, and field deploy a zinc flow battery storage system. So, think big battery, utility scale application, much like the gentleman from SCE just talked about. The early stages are cell and system development, so that will be going on for the first couple of years. Once we have our concept and our general design pretty well established, we want to field demo that. FEG's Modular Generation Test Facility, and some of you might be familiar with that facility, a number of the do-it [phonetic] technologies were tested there, because we want to get a not quite in our own backyard sort of test and look at our basic building block. And ultimately we are looking to install a 25-megawatt -- 75-megawatt installation at our customer site at Modesto Irrigation District. That application is a wind farming application. MID has about 180 megawatts of wind that they are dealing with now, and they are looking to increase their wind and solar generation in response to their RPS requirement. They expect that they will be responsible in the future for doing more of the farming related to those technologies coming online. So, that is our primary application, but, as with the SCE system, this system will

be developed, it will have the capability to do the list of 13 that you were all curious about, those values, and particularly with Modesto, we are going to be doing some modeling studies with the to understand the other value streams that come into play in their particular applications. So we call it a wind farming project, but, you know, more to be said about that. The attractiveness of it is low cost and a smaller footprint solution, I have a slide on that in a minute, and we are looking at using local source manufacturing. Our facility is in Alameda. We are going to be moving all the way up the freeway to Hayward as we expand, and are looking to tap into certainly local talent and do manufacturing locally.

So, this is generally the value proposition of why this battery and not some other battery. The footprint gets smaller as you go to the right, and cost gets smaller as you go to the top, and these are directional arrows, but just as a – we are a three-hour storage system, our goal is to make them smaller and cheaper. And I also should point out the difference with the lithium battery technology is you can go buy those now, and we are still about two years before we have product in the field.

This is what are system is essentially going to look like, this is 75 megawatt hours worth. These, we are developing our building blocks to be in 45-foot shipping

containers, stackable up to three high, which also helps with that footprint issue, this one is actually at a substation, the MID application will be at a substation and also this is the artist's rendering. The technology is actually fairly mature, the core electric chemistry is fairly mature. EPRI had done a lot of work on the zinc chlorine technology up through the mid-'80s, I think, there were funding issues. The reason why they did not push the technology further, Rick Winter had worked with Phil Simmons and taken advantage of new developments in flow battery technology and new developments in materials technology, to come up with the basic design. And I would like to point out that Rick took advantage of the $95,000 CEC grant and his garage was, in fact, involved, so sometimes I think it works the way that we all think it should.

COMMISSIONER BYRON: Was he raising any chickens in the garage?

MS. CANDELARIO: I do not know! We had a picture of his garage design and I convinced him that it is just a little, you know, a little too clunky for this purpose, but in retrospect, we probably should have brought it.

COMMISSIONER BYRON: Okay, Mr. Gravely, we want to make sure we keep track of this one, okay?

MS. CANDELARIO: So this is really our AC building block module. This is what is going in the shipping

container, the little tanks you see are the basic cells, they are in pressurized containers, one of these pods, one of these shipping container sizes is about 660 KW, they are built to be a 480 volt AC installation, again, a lot of thought around making sure that they are transportable and modular so that they will fit in substation applications, any number of applications with substation applications, in particular.

Our schedule, as I mentioned before, the first year we are really developing that basic cell technology, the technology in the tank, and then Year 2 is about the DC component, the power conditioning units, the control units, so that, by the end of 2011, we have a standalone DC system that – I am sorry, AC system – that we can install at PG&E. That will really help us freeze our building block design going to production, and have 42 building blocks produced and ready for installation at MID in early 2013, and then we have two years of evaluation – field evaluation that we are doing at that point.

I also want to mention, MID is our customer in this case, but we also are really looking to MID as a partner and we have just put an agreement in place with them so that we can share information. We are really looking forward to having them help give us good advice and grounding from where we are developing our specifications, and we are

developing our test plan for PG&E, and really value their participation in this particular project. We also like the fact that they are a Muni, they are kind of mid-sized, so fewer variables than dealing with a really big utility, but I think a large enough utility to really make us think hard about what our module can do when we are done.

So, as I mentioned, work has been going on, a lot of work going on in the lab optimizing the chemical and the electrical operating parameters, looking a lot at commodity materials. One of the ways to keep costs down in this particular technology is not to develop a bunch of new exotic electrode or electrolyte materials, so really looking at commodities materials, and also looking at thoughtfully outsourcing some of our components. I think one of the risks that sometimes start-ups have is they have a lot of really bright engineers who want to build everything, and I think we have been challenged in not going down that path probably a couple of times already and have more of those challenges to come, but it is very clear that, if we are going to develop this cheaply, that we need to look at outsource to be very thoughtful about what we are doing in-house.

From our program perspective, several people mentioned that they are working on metrics and reporting, this is part of our DOE requirement and, of interest to all

of us from the standpoint of really being able to understand what we have accomplished after we have this thing in the field and operating – is it really going to do what we thought it could do and are we really seeing the value out of it that we thought that we were going to?

We are also working on a customer requirement specification. We are trying really hard early in the process to not build a system that we want to build, we are trying hard to listen to our customers and build a system that they actually can use. So, this involves a lot of – a lot of talking with people who have battery systems in their hand, that is actually not a real long list, and also talking with people who have done a lot of thinking about it. We are early in that process and it is kind of one of those things where you think you are never done, but certainly what we see is a real important effort early in the process. IP position – you know, a big deal for start-up companies, we have four patents filed with several in progress, and we are growing according to our plan. We are in Alameda right now sharing space with an incubator-type organization, we are sharing an office space, we are growing out of that and we are going to be moving to Hayward hopefully next month, which will allow us to expand our testing operation.

Our funding – we were one of 16 DOE Smart Grid

storage demonstration programs, that was a $14 million award for us, out of our total $47 million. That allows us really to – it enables a three-year commercialization plan, as opposed to a much longer commercialization plan. And we just learned yesterday, we were very excited that we are on that list of ARPA-E recipients. We had submitted an application for alternative electrode materials and not something that we would have done otherwise, we are very very focused on getting our core technology developed, but it will certainly give us opportunities that we otherwise would not have. We were one of the five CEC recipients for Smart Grid demonstrations, and as I mentioned as a follow-on to that initial $95,000 worth of funding that was critical in improving the concept, and that funding is going to go mostly toward that early cell development that I mentioned, and helping us with our production process design.

Expected outcome, the biggie, is a reliable energy storage system and with quantified benefits, to really understand what it is doing and what it is not doing. And we think, in terms of jobs, that we are looking at probably over 100. That probably should be a TBD, and I think that we will be challenged to sort through what jobs would be created with the funding, without the funding, and what with. But, at the end of the day, it certainly will be fairly significant and certainly will help us in terms of

accelerating the development of our technology, no question about that. We also think that we are going to see a reduction in greenhouse gas benefit [sic], that is one of the benefits that we are going to be looking at with MID, and then, as I mentioned, there are other benefits that we are looking at with MID so we can make an assessment for that particular application, what in addition to wind farming are they able to get out of their system?

When I put this challenges slide together, I did not really mean to make it a generic any new start-up developing technology slide, but it kind of looks that way, I think it just says that there is really nothing special about us from a cost perspective. We are concerned about our production facility design, and we have been bringing in experts early to help us with our thinking about that. I already mentioned the material component cost, doing aggressive sourcing, thoughtful sourcing, in order to keep those costs down. Everyone developing batteries, I think, pretty much worries about material stability or the life of the battery. And from a thermal modeling perspective, our battery does not have active cooling, so there are no chillers, no AC units, so the thermal modeling is particularly important in this particular design and just the basic automation and communications. From a resources perspective, we have actually been doing pretty well in relation to our technical

team and having access to great technical talent, we have been able to hire people with a lot of experience and hire the sort of technical experts that we need to, and we are hoping that we do not run into issues with that, going forward.

So what would we do differently? It is probably a year early to ask us that. We still have not definitized our DOE Agreement yet, although we can definitely say that the DOE and CEC funding is really critical to our development. We certainly think that we can get more efficient internally in how we go after what I fondly refer to as OPM, Other People's Money, and from a CEC perspective, it really helped us a lot that this particular solicitation was tied with the DOE solicitation. So it makes it leaps and bounds more efficient for us to administer and have that relationship with the CEC. And in a past life, I was responsible for both DOE and CEC funding, and they were not connected, and it was a real challenge in terms of administration. And I will not bring up the reporting issue, everybody else has covered that pretty well.

One thought that occurred to us, at least to consider in the future, is that we have a $47 million project, the CEC contribution to that project is $1 million, and yet CEC is going to have to live with us through the five-year duration of that project, so it may be something

to think about in future projects, if there is a carve-out that is sooner, I do not know, but that seems like a long time to hang with a project given the size of the project and the size of the CEC contribution, so, again, I think something to think about. And the last issue that I identified is kind of a nit, and it was not necessarily an issue, it is probably more reflective of the paranoia that smaller companies have about their IP, but we did seem to have a lot of discussion about, "Well, who is going to look at it? How detailed do we need to get?" We seemed to have an inordinate amount of handwringing about that. In talking with some other groups, I think we all were facing some kind of similar issues, so, again, not that that was any particular issue with it, it is probably more our issue than anything. So, with that, were there questions?

COMMISSIONER EGGERT: A quick question, I apologize for having to step out and if I missed any of the discussion on the costs, by my calculation, for the total program you have got $47 million for a 75 megawatt hour capacity, so – is that right?

MS. CANDELARIO: I am sorry – 47 –

COMMISSIONER EGGERT: $47 million for a 75 megawatt hour capacity?

MS. CANDELARIO: That is correct.

COMMISSIONER EGGERT: So that is about $626 per

kilowatt hour, and then, for the A123, I realize that these costs are more than just the actual battery cost, they include a lot of the programmatic activity and stuff. For the lithium-ion, it is about three times that, $1,800 per kilowatt hour, and I guess that was just – is that number, the $626 sort of a reasonable reflection of where this technology is in terms of cost?

MS. CANDELARIO: Here is what I would say about that. Customer No. 1 is going to pay a different price because they are taking a different risk than Customer No. 2, so the price that MID would pay for the first system is less than what the next customer would pay. And I do not think we know what that math really looks like yet, but from the math that you just did, to look at Customer No. 2, the number would need to go up.

COMMISSIONER EGGERT: So you are sharing some of that cost as part of your development budget, I would – is that what you are saying?

MS. CANDELARIO: Yeah. And I would say that part of the learning for us, even going through this process, is really understanding what does it really cost, you know, we can speculate, I mean, we think that number is probably not what we would sell it to Customer No. 2 for, but do we have – you know, we are not at a point in our development yet where we have hard numbers to really say one way or the

other.

COMMISSIONER EGGERT: And in terms of the sort of as built, final cost evaluation, is that information that would be available as part of the project reporting?

MS. CANDELARIO: I think we have not negotiated that yet.

COMMISSIONER EGGERT: And then, actually, a curiosity with respect to – you mentioned the IP issues, which I know are oftentimes tricky and challenging when dealing with Government funding, are you saying that those were able to be resolved satisfactorily?

MS. CANDELARIO: Yeah, I think when you talk about generically, people get twitchy, but when you sit down and talk about, well, what reasonably makes sense to share at what point in the process, I think that can be worked out.

COMMISSIONER EGGERT: Okay, thanks.

COMMISSIONER BYRON: Ms. Candelario, thank you. I was not aware of this project and, of course, these are really exciting projects to us because we are quite concerned about how we are going to integrate renewables in a more substantial way, and this addresses the firming of intermittence at the generating source, which is probably what we want to end up doing.

MS. CANDELARIO: In this case, it is not at the generating source, it is at the Modesto Substation.

COMMISSIONER BYRON: Okay. Yes, I think I am thinking more in terms of vs. larger storage projects, but that is all right. Still, a very good project. A couple questions. And I may have missed this, and I am sorry because you may have gone through this quickly, but you have got a field demo with PG&E and then, of course, you indicated you were going to do an installation at Modesto Irrigation District.

MS. CANDELARIO: Yeah, and I probably was not very clear about the field demo that PG&E did. The purpose of the field demo, that PG&E needs to take one shipping container size module that is – at that point, it is an AC module because it is has power conversion electronics in it, and test that at PG&E in their modular generation test facility, in their lab facility. And then, it is basically the proof of our design, and then we go into full production with that design to develop in Modesto – the Modesto system.

COMMISSIONER BYRON: Are either of these utilities participating financially?

MS. CANDELARIO: PG&E or Modesto? Modesto certainly will be paying a lot and I think the number that was part of our DOE proposal was around $47 million for this system. PG&E is watching, we think it is a good thing to involve PG&E. Certainly, their modular generation test facility is something that we use as a third-party – as part of a third-

party service that they provide, but we think that, by doing the test at PG&E, it lets them get closer in on the technology and be able to see what we can do.

COMMISSIONER BYRON: And you are the lead contractor on this, correct? This is not a demonstration project, this falls under a different, oh, Project Opportunity Notice, I suppose they call them, than the other ones that we saw presented to us earlier today, is that correct? Mr. Gravely, do you know?

MS. CANDELARIO: For the DOE, or for the – oh, go ahead.

MR. GRAVELY: I believe this one was a part of the 36 instead of 58. Fifty-eight was infrastructure, you saw some of the infrastructures, I believe this was a community store one, which was part of FOA36.

COMMISSIONER BYRON: And so you are the lead – thank you very much –

MR. GRAVELY: So they are actually doing demonstration as opposed to an infrastructure demonstration.

COMMISSIONER BYRON: Gotcha. So you are the lead contractor on this, then?

MS. CANDELARIO: Yes.

COMMISSIONER BYRON: Where would you be without these ARRA funds? Where would this project be?

MS. CANDELARIO: It is hard to say, but I would

refer back to the comment that the gentleman on the phone made, Craig Horne from EnerVault made the comment about the competence from your investors, I think that definitely applies in this case, you know, if somebody else loves you, well, then they love you more, right? The risk is different. So very hard to say, but I think there is no question that it accelerates the timing of the technology in the field.

COMMISSIONER BYRON: Good, and that is really what we are after, and I am glad to hear that. One last question, you had indicated, I believe you said, well, you may not have said "definitized" –

MS. CANDELARIO: I did.

COMMISSIONER BYRON: -- but you have not finished your contract with the Department of Energy. Could you give us a sense of what the hold-up is? Maybe that is a bad choice of words. Is it intellectual property, what other terms and conditions apply?

MS. CANDELARIO: No, I think it is just that there are a lot of projects and few staff. We had –

COMMISSIONER BYRON: We understand that problem.

MS. CANDELARIO: We know you do.

COMMISSIONER BYRON: So are we a problem at all on this contract?

MS. CANDELARIO: We have not gotten far enough to

know. But I want to say that your staff has done a great job of outreach and have provided us with as much information as we could possibly want to know. I certainly feel like the minute we sign with DOE, we are ready to push the button and send the information to the CEC, and I do not know what more your staff could have done other than that, so we are not sitting back guessing what the requirements are, we are not guessing about how you fill out the form, we have been given all the information that we could want on that front. So, so far, very good and the staff have been very sensitive about the issue of – we only want to report once and those types of things, so we appreciate that.

COMMISSIONER BYRON: One last quick comment. These are exactly the kind of projects that I believe ARRA had in mind, of course, they have got the large utility infrastructure demonstration programs, which we heard about earlier, extremely important and helped advance the football here – when I say that, they help advanced our policies, they help advance the technologies, but to see private sector get involved taking advantage or a energy innovation small grant program develop into a company that is now commercially funded, moving forward with new technologies, this is the model that really creates jobs. I am really glad that – I appreciate you taking your time out to be here with us to share the project with us, that these are the

kinds of projects that we are very interested in also advancing.

MS. CANDELARIO: And we are extremely appreciative.

COMMISSIONER BYRON: Thanks.

CHAIRMAN DOUGLAS: Good. I have no questions at this point, I appreciate you being here, it has been great to learn more about your project. Thank you.

COMMISSIONER BYRON: Good luck.

MS. KOROSEC: Do we have any questions from the audience?

MR. KRIEGER: Yeah, I do. Tammy, you had mentioned that 100 individuals are going to be employed. Is that in the actual build-out of the energy farm itself? Or in its continuous maintenance after it is up and running?

MS. CANDELARIO: Actually, there is kind of three pieces to that when you think about jobs, the first is that there is a team that is developing the technology, that team is probably 25ish, 30. Then, you have the team that comes in when we start to do production, so there is the manufacturing component, and that really is the big spike in the number. When we start building 42 modules, that is when we start bringing on a lot of labor to do that production. The trickiness in the number is we can figure out how many people it will take us to do production at a certain volume over time, but how do you kind of slice that to count? What

is the DOE, the ARRA funding, and [inaudible] [1:19:18], it actually has more to do with the production. Part of the beauty of battery storage systems that we are anxious to demonstrate in the field is that they do not require a lot of maintenance, so yes, once you install it, it is fairly modular, so most of the build, the idea is that most of the build is actually done in the manufacturing facility, so that tends to be where the jobs are. There will be some, you know, construction that needs to go on in the substation site, not a big jobs add, probably. And, from an ongoing maintenance perspective, also not a real significant jobs add, a few, but really it is about the production.

MR. KRIEGER: And I also, the fact that your ultimate goal is 75 megawatts per hour – is that –

MS. CANDELARIO: 75 megawatt hour, so this particular application is 45 megawatts.

MR. KRIEGER: I notice that the solar farm down in Mojave is something like a $1.4 or $1.5 billion investment, and I understand – help me understand this – that it will employ about 1,000 individuals in the construction of that solar farm, but the maintenance of it, the figures go way down, something just about 10 or so individuals to maintain from what I understand, and I have read the reports on it. So, I think you have done really well because your rate shows about $400,000 or $500,000 per worker of its 100

workers, and theirs seems to be about $1.5 million per worker, so you have done pretty well, I think. I do not know what their megawatt eventuality is, but that is fairly impressive.

MS. CANDELARIO: We will apply it when we get there, but a lot of the point is to have a system that is not expensive to implement.

MR. GRAVELY: Sorry, I know we are running a little bit – I just wanted to clarify something real quick because all the people have said the same thing. In the reporting element, we mentioned that the PIER will accept the Federal responses, also, as you have noticed, many of these contracts are very large, and so you do not have to spread the CEC funds over the whole five years, it can actually be an earlier, smaller task, and so you do not have to – you can do your task early, the requirement is you continue to provide us the reports even when the PIER task is done, but you do not have to make it a cookie cutter spread across the whole project, you can do it upfront and you can receive the funds early on, but you just have to decide that when you do your Statement of Work.

MS. CANDELARIO: And, in fact, we looked to do that and that is where the acceleration comes in because it helps us bring on labor sooner.

COMMISSIONER BYRON: Good.

MS. KOROSEC: We do have a couple of questions online from Maxine Scheer [phonetic]. "How much funding is MID contributing?"

MS. CANDELARIO: We need to go through the process of getting our technology deployed at the PG&E level and then MID is looking at a funding level of about $27 million.

MS. KOROSEC: All right and, "What was the choice behind the Primus Power locating in the Bay Area vs. other parts of the State?"

MS. CANDELARIO: I am not sure I am probably the best person to answer that question. The founder and CTO lives in the Bay Area –

COMMISSIONER BYRON: That is the answer.

MS. CANDELARIO: But I think, also, there was consideration given about the talent pool in the Bay Area. We, as with most start-ups, really look to very specialized talent, it can be very competitive for that talent, and we need to be able to have access to either attract people in to California, or invite people aboard.

MS. KOROSEC: All right, thank you very much. Now we are going to switch gears a little bit and be talking about transportation, so we are speaking of the Alternative and Renewable Fuel and Vehicle Technology Program and we are starting with Jennifer Allen from the CEC staff.

MS. ALLEN: I will make my presentation very short

because I am just the opening act. We need to get to the meat of the projects here. A little bit of background information. AB 118 was developing their Investment Plan and we were finalizing the plan about January of 2009, and in February, President Obama announced the American Recovery and Reinvestment Act funds that were going to be available, and projected about $37 billion, for starters. So we were looking at an adoption of our plan in about the April timeframe and, at the same time, the announcement actually came out for projects associated with the ARRA dollars in about March of 2009. So, we had over $170 million that we had the potential to leverage as co-funding for ARRA dollars, and the decision was made to try to go for the leveraging. The question was how to do it. We had two potential tracks that we were looking at, one was to go to the Federal Government and say, "Here we are, California has got over $170 million in transportation funds that can cost share dollars, and so would you consider us for a cost share and we will administer the funds for you?" And then, the other potential was that we would come out with a solicitation to allow our money to be used for cost share; the problem with that was, we would have to put out a solicitation without any idea what the Feds were going to be putting out. It ended up being that that was the route that was taken, and what we were allowed to do with our

conversations with the Department of Energy was to go ahead and put out a solicitation based on whatever – a generic sort of solicitation, we would accept applications. In this case, we had a table with what we thought were going to be the potential solicitations that were going to be coming out from the Federal Government, and with a lot of to-be-determined in the dates. And as the solicitations came on board, what we did was we just basically kept amending our solicitation, and I want to point out to everybody that this was PON-08-010, so it was the solicitation before PIER, and so we basically paved the way for PIER to be able to do their solicitation.

So, the Investment Plan was adopted April 22nd of 2009 and the solicitation was posted April 22nd of 2009, and that was also Earth Day. And we had it limited to Applicants who would be submitting proposals only to transportation-related on our solicitations, they had to be consistent with our Investment Plan that had just been adopted, and we were just basically offering up ARRA funds if you were successful as cost share. We looked at – and these are actually in the order as they came up and as we added them to the solicitation – we started out, the very first one was Transportation Electrification. We basically had two weeks to get three proposals in and to take a look at those proposals, and to have a letter ready to go for the

Federal Government. And so there was a potential of $378 million in Transportation Electrification. The next big one was $2 billion for Battery and Component Manufacturing. And then Clean Cities. So, those were the three large solicitations that we were really looking at. And the rest came in further down the road, but we were already well into the first three by the time we were looking at the TIGGER, the Transit Investments for Greenhouse Gas and Energy Reduction, which were strictly for transit agencies, and the Integrated Biorefinery Operations, and then the very first ARPA-E solicitation.

So these were the dollar amounts that were being offered from the Feds. Here is our proposals, these were the final proposals that went forward to the Federal Government, with Letters of Intent from the Energy Commission, so out of $378 million for Transportation Electrification, California sent forward $785 million in projects, and then you can see – so for $2 billion, we had $319 million, Clean Cities, $425 million. And so on. What we got was $88 million in Transportation Electrification, zero in manufacturing, $26 million in Clean Cities, zero in TIGGER – these were projects that were associated with the AB 118 solicitation. Demonstration of the Biorefinery – zero, and Advanced Research, we got $4 billion.

COMMISSIONER BYRON: Where did all the money go?

MS. ALLEN: To the other states.

COMMISSIONER BYRON: Did it go to Michigan?

MS. ALLEN: Michigan? Yes. Illinois, I think, also got a pretty good chunk. I think Texas got a few dollars, too. Transportation Electrification, $21 million, is what actually went out in AB 118 dollars, so obviously in manufacturing we had no dollars associated with that. $22 million in Clean Cities, and then down to ARPA-E, we had $1 million. So this is, what, out of the over $170 million that we started with, we ended up with three solicitations that we were successful in getting projects in.

So a summary, there was $3.4 billion available in these six solicitations, we ended up having to process 193 applications for $1 billion in AB 118 funds, and $2.85 billion in Federal dollars that were being requested. And, in the final proposals, we processed 108 applications and that was for $624 million of AB 118 dollars and going for $1.82 billion of Federal dollars. So, we processed a total of 301 applications within about a span of eight months. And as a result, we now have the five – these were the projects that have gone forward and we are in the process of negotiating or completing agreements with them, and five of the projects are going to be speaking to you today.

MS. KOROSEC: Do we have any questions from the dais?

CHAIRMAN DOUGLAS: Thank you, Jennifer, you have gone very quickly what was presented, months and months and months of very hard work and effort and thought, and just trying to meet the 118 program demands and the DOE timelines and the needs of Applicants mesh in any kind of logical way, so thanks to you and staff from the Fuels and Transportation Division for marching through all of that. I guess we will see today at least some of the benefits of that work.

MS. ALLEN: Thank you.

COMMISSIONER EGGERT: Actually, just a quick comment. Thanks for your presentation. I think there are probably a couple different ways you can look at this, 1) that certainly on some of these solicitations, we did not do as well as I think we might have hoped, particularly on, for example, Battery and Manufacturing, where there was a big goose egg; I guess the other way to look at it, and I think actually the table in Mr. Perez's first presentation shows it a little bit more clearly, which is, if my math is correct here, the $36 million that we did eventually expend as cost share, leveraged about $105 million ARRA and $106 million additional funds.

MS. ALLEN: Uh huh.

COMMISSIONER EGGERT: So, from sort of that perspective, on those projects that we did fund, we got a significant amount of leveraging.

MS. ALLEN: Yes.

COMMISSIONER EGGERT: I guess, based on all the experience, and given that you were sort of in the thick of it, do you think that there were things that we could have done differently to increase our success?

MS. ALLEN: I think what made it a bit difficult is we were the first. And so, at the time DOE was just starting to put out solicitations, they really did not want to entertain a state coming in, regardless of how many dollars were available, and they basically did not quite know how it was going to work out, and so I think that they already had their marching orders and they were going to stick with it. And so, they wanted all the states to come in basically on the same footing, and just come in as a proposal, without any pre-negotiation for projects. And they also had certain things that they were required to be doing and that is why, on the front end, there were some projects that very clearly fell into certain states because, from an economic recovery standpoint, there were things that they were trying to accomplish by having funds go to those states.

COMMISSIONER EGGERT: All right. I guess, maybe as we hear from the subsequent presenters, I would be curious to sort of hear from them their experience through this process, both in terms of, you know, working with our 118

program for the purposes of the cost-share for these activities, and then also kind of going forward, how we can best engage with them to maximize the benefits of the projects. So, thanks.

MS. KOROSEC: All right, next we will hear from Mr. Ray Hobbs on the ETEC Project.

CHAIRMAN DOUGLAS: And I think I will just speak now before we begin with the presenters, to ask you to be both thorough, but also succinct in going through the presentations. I am sure we will have questions for you and all of you, but rather than completely squeeze the last presentation, I will just put a – and, of course, we can and often do go past the hour for adjournment that we optimistically post in our agendas, but, in any case, if everyone would be mindful of the time as we move forward, that would be helpful.

MR. HOBBS: Madam Chairman, Commissioners, ladies and gentlemen, thank you for giving me the opportunity to present the EV project today to you. My name is Ray Hobbs. I work for Ecotality. In September of 2009, Ecotality was awarded the largest Federal award for the deployment of electric vehicle and infrastructure in the United States by the Department of Energy. We call the project The EV Project. We really can keep going this way. Why do the EV project? There are three reasons, first, there are just not

enough [inaudible] [1:37:26]. In 2009, the United States imported just under 200 billion gallons of oil. This imported oil hurts our economy. If you give any value at all to that oil, let's say $70.00 a barrel, you wind up with over $300 billion a year going out of the economy. That works out to just under a billion dollars a day. And the third point is security. All of this imported oil puts money into the wrong hands of people who want to do harm to the United States, and requires the support of our [inaudible] [1:38:00]. And moving all this oil around the world definitely has environmental consequences. The problem is not the car, America has had a love affair with the car, it has driven us enough to require manufacturing, it is a major personal outlay of our finance, and it occupies a big part of our lives and our lifestyle, the problem is not the car, it is the fuel. Could electricity replace oil – imported oil? I think it could. Electricity is just an instantaneous energy currency, it is used, it is made from other resources that are converted to electricity, making it easy, convenient, and clean. Today, in the U.S., we find electricity practically everywhere. We make electricity with our own stuff, we do not need to import anything. But we do buy an electric car. Have you ever driven an electric vehicle? Have you ever seen one on the street? Have you ever seen a re-fueling station for an

electric vehicle? Would you buy something you have never seen? You may have concerns about the electric car. "How far can I go before I have to charge?" "I can't find a place to charge." "I have to wait a long time to charge." The challenge for the electric car is not electricity, that is everywhere. The challenge is the charging infrastructure. You may be sympathetic to environmental issues and concerned about seeing all that money for imported oil go out of the United States, but you have a life and you need real personal ability that fits around your lifestyle, not your lifestyle fitting around your fuel in your car.

This project, simply put, puts enough electric vehicles and charging infrastructure together in a confined geographical area of the United States to figure out what is needed to make the EV Program fit into our lifestyle. With all this equipment and people running around in large cities, if we are going to figure out what works and what does not, the Electric Vehicle Program supported by the United States Department of Energy has some major goals, 1) the accelerated sales of advanced electric drive vehicles, 2) to reduce imported oil, and 3) to create jobs. The information gathering in the use of both the vehicles and the charging will be the foundation for planning and modeling of something we will call "the Roadmap" for a large

deployment of electric vehicles in the future.

Ecotality is the Program Manager and is responsible for the deployment of the charging infrastructure and to create the roadmap. Nissan and GM will provide the vehicles, and the EV owner will provide the source of information: How do they like to drive? Where do they want to charge? And how to fit the electric cars into their lifestyle?

Now, you may not know much about Ecotality and I will not spend a lot of time going over it, but I will briefly say that we have got 20 years of experience in testing electric vehicles and hybrid vehicles for the United States Government. We have 20 years in battery testing, we have 15 years in Smart Charging and Fast Charging, and we have got a whole bunch of time and experience with the electric utility and industry and understand the challenges that it faces today.

Here is a picture of the charge line-up and the vehicle deployment of 1997 and 1998, where California led the nation in asking for a zero emission vehicle mandate and it fell away. The EV project has three primary elements, cars, chargers, and a plan for the roadmap. The cars, we are going to deploy about 8,300 vehicles across the United States; chargers, there will be about over 15,000 Level 2 chargers and over 300 Fast Chargers. This large scale

deployment of charges supporting infrastructure is going to make it easy to find EV charging. The information and the analysis about how this equipment is going to be used will create the basic information for the roadmap, and the plan going forward will create a 10-year regional plan for each area. We are going to learn what works and what does not work, we are going to see the effectiveness of this hardware, and we are going to understand the commercial activity. These lessons will assist in planning the future.

Now, this project does not encompass the entire United States, it is just in specific geographical areas, encompassing close to 45 million people in those metropolitan areas. In Washington State, the metropolitan area of Seattle; in Oregon, the metropolitan areas of Portland and smaller communities, Eugene, Salem, and Corvallis, that would be an EV corridor; in California, the metropolitan area of San Diego and Los Angeles; in Arizona, the metropolitan area of Phoenix and Tucson; in Tennessee, the metropolitan areas of Nashville, Knoxville, Chattanooga; new to the project, the State of Texas, Dallas and Houston; and now the District of Columbia, with Washington, D.C.

Here are the two vehicles that are going to be part of the program. On the left, you see the Nissan Leaf, and on the right, the GM Volt. And the Nissan Leaf is 100 percent battery powered, and the Volt is an extended range

plug-in hybrid. These vehicles are going to be developed in the United States, they are going to deploy in each region, these are going to create local jobs in dealerships, sales, and service.

Unfortunately, not every grid connected vehicle will be part of the EV project in these identified regions, only owners who meet certain criteria and agree to project participation will become part of the EV project. But all of the grid connected vehicle owners will have an opportunity to use public charging, providing that vehicle is compatible with those chargers. Now, to figure out what real effective infrastructure is, the project needs people to use them. We need people using their cars, traveling back and forth across the cities, and we are going to need folks using that charging infrastructure. This project needs information about how people operate their cars and how they use and react to the charging infrastructure. The sales of the Chevy and Nissan grid connected vehicles are not limited to just project participants; there may be many more vehicles in a region than those who participate in the project. Although electricity is everywhere, there is no direct charging infrastructure to support the electric cars. Ecotality has specific responsibilities in this program and we will collaborate in these regional areas with government, utilities, businesses, first responders, and others who have

an interest or authority in providing the charging infrastructure. We will identify barriers and create plans to overcome any problems to the deployment of the charging infrastructure. Second, Ecotality is going to deploy the regional charging infrastructure, which will be a combination of home charging and commercial charging and fast charging. There will be controlled access to the commercial charging. The effectiveness of the charging infrastructure will be determined by gathering the analysis of operating data and feedback from EV owners and commercial businesses. Operation data will be compiled by the DOE, by the Idaho National Engineering Lab in Idaho Falls.

Lessons learned from the operations now and straightforward feedback, and also Smart Grid operational results. Carmakers and business models will be the foundation to create the economic models and plans for the future deployments. Just a footnote about the chargers. Chargers are classified at three levels, Level 1 is 120 volt standard outlet, the outlet in your home; Level 2 is higher voltage, up to 240 volt, and up to 6.6 Kilowatt hour from an AC outlet, and Level 3 is the Fast Charging which gets you on your way, in the case of the Nissan vehicle, in about 20 minutes.

Ecotality is going to install 2,500 chargers per region. Now, that is going to be when a new EV owner

purchases their car, they will be given an opportunity to participate in the Electric Vehicle project. If qualified, Ecotality will install a Level 2 charger at their home at no cost, it will be free to them. Since the project covers about a thousand vehicles per region, only about a thousand EV owners will be project members. Local contractors will be trained and certified to install these chargers to create local jobs. After that, we will install 1,500 Level 2 chargers to a commercial locations, allowing a work, shop, and travel feature, and we will follow-up with about 50 Fast Chargers for commercial use. This high density of public charging infrastructure cars will establish easy access and there will be several EV corridors provided in some of the cities.

How do you drive your EV? Where do you want your charge and when? How do you want to find charging? What do you want to do during charge? And how do you want to pay? These are some of the questions we hope to answer in this project.

This grouping of charging infrastructure in a community, we refer to as the EV Microclimate. Let me ask you, where do you want to be? If you own an EV, where would you like to charge? How about a gas station? Why is refueling time really important at a gas station? Because that is the only place you can go to get your fuel for your

gasoline car, and you really do not want to be there, so getting in and out is very very important. You do not want to hang around a gas station longer than is absolutely necessary, but if you wanted to be somewhere, if you like being there, it would not matter about the time because you are where you want to be. Can you put your lifestyle and a gas station together? Most of us cannot. Our goal is to identify your lifestyle with EV charging, you are doing what you want to do when your EV is charging.

Now, this roadmap that we are going to be creating is looking ahead, and we are going to develop 10-year regional plans for each of the areas that we are in, and we are going to look at the deployment area, the electric vehicle and charging deployment and penetration, and the charging infrastructure requirements. The models for the infrastructure, we will create models for the next 500 cities in this Electric Vehicle infrastructure deployment and we will experiment with the controlled access for commercial and public charging. For sure, this is about hardware, but our goal is really to identify your lifestyle and to put charging infrastructure around it, that means we are going to need information to begin building models, including electric vehicle sales, where to install the charging, the impact of the electric grid from charging, and the commercial opportunities with risk assessment.

It has taken more than 100 years after the early success of the automobile to get us to where we are today. The EV is different than Henry Ford's evolutions. The EV is more connected. We are spending about a billion dollars a day on imported oil. And what do we get with that? Well, tankers crossing the ocean, our Navy guarding in national shipping lanes, our kids in the Marines and Army fighting terrorists, paid in part with imported oil, air pollution, respiratory health concerns in some cities, and enjoyment of filling our car with imported oil and fueling it quickly. How about putting our refueling and our charging into our lifestyle, rather than putting our lifestyle around refueling? EV refueling does not require environmental permits, it does not need oil tankers, or kits to prevent access to it. Electricity is everywhere. We can put that charger where you want to be, and where you want to go. You do not have to hurry with EV charges. I do not think anybody will argue about the benefits of electricity, it is made in lots of ways, so there can be a lot of it, and it is made everywhere, including right here. It uses regional resources, it creates regional jobs, it advances regional economies, and environmental stewardship is assured through regional oversight. It is a safe and secured source of energy.

This project will define a new fueling system; this

project will shape the future of transportation. This is just the beginning. You wonder what new products and services will come out of this effort, what new businesses and opportunities, what new jobs. If you think about it, what is the connection today between Starbucks and your car? There is none. What about between Barnes and Noble and your car? There is none. What about your I-phone and your car? There is none. We have seen innovation in communication and consumer electronics. What would happen if we combined our cars, communication, consumer electronics, and modern lifestyle into one new industry? This project is about creating a different future. Our families are very important to us, our lifestyles, our family, our priorities, the automobile has made an enormous impact to America and how we grew, and it is not going to stop. But, what makes that automobile go is going to change, electricity is everywhere, but the EV charging network must be invented, it is going to be new, it is going to be different, it is going to transform our interaction with our car for a new sustainable lifestyle, and it is going to create new economic opportunity, invention, services, and jobs.

In bygone days, Americans were pretty independent, Native Americans, pioneers, the settlers, farmers, factory workers, our great grandparents, our roots, this project is the first step to change the type of energy used for

personal transportation, one that is safe and secure, one that is more in harmony with our environment, one that is sustainable for future generations, one that is higher efficiency than the past, one that can help improve the quality of life in our cities, one that can create new economic opportunities, and one that makes us more independent. This is just the beginning, just the first step, it will be the future, and it will be exciting. Thank you.

COMMISSIONER EGGERT: Thank you very much, Mr. Hobbs, and this is very exciting, and I think you have put an incredible program on your hands with respect to the coverage across the country and we are very happy that there is going to be a significant level of activity going on here in the state. I have actually three questions, the first two, I think I know the answer to. And the third, I do not. So I will ask all three, anyway. Could you maybe expand a bit upon your interactions with the utilities in the areas that you will be deploying the charging infrastructure here in California? And then, the second one, interaction with any of our existing PIER Research Centers, in particular, I am thinking of the Plug-In Research Center at University of California at Davis? And then, I will hold the third question.

MR. HOBBS: Well, let me take number 2 first, Davis,

University of California at Davis is part of the project, as is Ohio State. So they will be right in there with us trying to figure out what all this data means, and the implications for it. We have got a whole bunch of utilities working with us across each region that we have the utility members, and we will be meeting with them, and we will try to work with them on the Smart Grid program as each utility tailors it. So, there is not a generic answer to this, but I know, in the case of San Diego Gas and Electric, we are trying a variety of rates down there with the permission of California Energy Commission, to see how those customers react to it down there.

COMMISSIONER EGGERT: And do I understand, so this was originally focused around San Diego, but now it is expanding to L.A.? Is that correct?

MR. HOBBS: It is. L.A. is new and, of course, there is a lot of cars down there and a lot of opportunity, and Los Angeles and Southern California Edison have been great supporters of electric transportation in prior times.

COMMISSIONER EGGERT: Okay, then my third, my final question, is actually relevant to our earlier discussion about sort of what happens after the Stimulus. So, when does this become sort of commercially viable enterprise absent additional public funding?

MR. HOBBS: If you notice in my presentation, I

talked about lifestyle, we really want to work with the business community to identify the benefits that the electric car can bring to that business, and conversely, what those businesses can bring back to the person who owns the EV. So this whole thing of lifestyle is a real major driver for us because we want to insert this into our community and we are not going to win if we are less as desirable to gasoline, or equal to, we want to be better than, and that means good old - and I will say Silicon Valley has some great minds coming up with those new opportunities, those new inventions, those new gadgets, the new software to do stuff that you just cannot do today with the gasoline car, but you could do with a computer on wheels in your EV. And the EV charging presents opportunities, too. And one of the neat things is, after you kind of work with this for a while, and you see the excitement and the potential of this, but we have got to go out and do our job and sell it to the business community, too, because that is that beneficial relationship, that symbiotic relationship between the customer and the business, that is what we are really going to try to work.

COMMISSIONER BYRON: Mr. Hobbs, this is - I call this singing to the choir, okay? This is really good, it is so good to hear you also say we need to go out and sell this to the business community and the relationship with

customers is extremely important. You know, once we begin thinking outside what the needs of the policymakers are and what the needs of the utilities are in serving customers, and serving ratepayers, then we start hearing about customers. So, this is a really good thing. A couple of quick questions, I hope. First of all, it says in here, in your presentation, you have got all this experience, including 100 years of experience in the electricity sector. What is the predecessor to this company?

MR. HOBBS: Individuals who believe in the electric car.

COMMISSIONER BYRON: You have some old people.

MR. HOBBS: We do, well, look at me, you are looking at about 40 years right here, so –

COMMISSIONER BYRON: So you are talking about the cumulative years of experience, okay. And what are the conditions of participation? Maybe you said those, but I did not catch them.

MR. HOBBS: It starts out with something as simple as your Zip Code because we want to be sure that we have a concentration of EV owners and infrastructure in close proximity, so we do not want the stranded situation going with our project team members, so that is one thing; second, how far are you going to drive your car every day? Because we want you using that infrastructure, we want you going out

and being active in the community, so those are two really important pieces of information, and we have built these models that we want enough activity going on that we can take meaningful information away from them. There are other considerations, too, like what kind of electric service you have –

COMMISSIONER BYRON: I was going to ask about that. Okay, you know, 40, 50-year-old home, 100 amp service, maxed out, are you going to pay for a new 200 amp service in that house?

MR. HOBBS: No, we probably will not do that. We will not do that. So, that is one of the things that will help us put this package together. We do have limited funds and so we cannot do all the upgrades, unless the local utility wanted to….

COMMISSIONER BYRON: Well, can the consumer participate?

MR. HOBBS: Oh, yes, and that is, when you walk into your Nissan dealer, your GM dealer, in these areas, and you say you want to buy a Volt or a Leaf, you will go down through the questions, so those are the folks we are looking for. We are really looking for folks that are going to really buy cars and make up the future of transportation.

COMMISSIONER BYRON: Okay, well, thank you. Interesting project and it looks like we are in for about $8

million up against DOE, about what? Forty million dollar or so?

MR. HOBBS: The total project is $230 million, and the DOE is carrying 50 percent of the cost.

COMMISSIONER BYRON: Okay, so the numbers I just said, though, I took from the table which was just presented. Is that California's share?

MR. HOBBS: That must be California's share.

COMMISSIONER BYRON: All right, so 2,500 chargers, that is $20,000 a charger.

MR. HOBBS: Oh, they are not that expensive. You know, we put out these random numbers at this point in time, at the end of the day, it is really going to be who comes in and buys the EV, and so California buys an awful lot of vehicles, so when you take a look at the population let's say between Portland, Oregon and San Diego, between Oregon and Southern California, we see that this is just a general point of discussion. We expect to see disproportionate number of vehicles across the United States based upon population.

COMMISSIONER BYRON: So I could ask this question a number of different ways, but what I am trying to understand is, are you going to install chargers until you run out of money?

MR. HOBBS: Yes, until we are fully subscribed,

correct.

COMMISSIONER BYRON: So, it will be more than 2,500 chargers?

MS. ALLEN: We are also paying for a Smart Grid, some of the Smart Grid Study, so there is a portion, about $2 million of that, it goes for the Smart Grid coordination with the utility, and 60 – we have a larger number of the direct chargers, so we have 60 direct chargers.

COMMISSIONER BYRON: Okay, thank you. I –

MS. ALLEN: And a thousand home – only 1,300 commercial and 60 direct charges, and then we have a very large Smart Grid Study that goes along with this – a Smart Charging and Smart Grid Study that goes along with the utility, and then there is a lot of data collection.

COMMISSIONER BYRON: Thank you, Ms. Allen, my mistake to just do the simple math on this scope of work, that is not fair.

MR. HOBBS: That is great.

COMMISSIONER BYRON: Thank you, good project. Thank you.

CHAIRMAN DOUGLAS: So this has just raised one question for me. So, is your distribution of chargers, then, between states, within states, centrally driven by how many customers buy cars and in what region?

MR. HOBBS: Yes.

CHAIRMAN DOUGLAS: Both? Both. And that is true for both home and commercial, or retail place, chargers?

MR. HOBBS: You can see the models from trying to build – our attempt to predict EV penetration and the cost revenue opportunities, so it only works if we create good elements in those models, so it is very important, yes.

CHAIRMAN DOUGLAS: Thank you.

MS. KOROSEC: All right, next we will be hearing from Matt Miyasato.

DR. MIYASATO: Well, good afternoon, Madam Chair, Commissioners Eggert and Byron, and CEC staff, and members of the public, I am Matt Miyasato, the Assistant Deputy Executive Officer for Technology Advancement at the South Coast Air Quality Management District. And the project I am presenting on is a Goods Movement Truck Program that was sponsored in part by the California Energy Commission, but we think it represents a unique and cooperative model for a regional partnership because it involves not only a need-based technology in a certain environmental justice community, but also because it involves a regional governmental agency, it also involves the state government, as well as the federal government.

I would like to start off by providing some background and explicitly stating why there is this need in Southern California. Now, the South Coast Basin is a four-

county region made of L.A., Orange County, Riverside, and San Bernardino Counties. Over 40 percent of the state's population resides in our region, and so I know that Commissioner Boyd likes to say it is the Nation's State of California, and we like to think of ourselves as perhaps a sub-nation within that nation state because we have a high population density in our region, but also a high population of light-duty vehicles and, especially, heavy-duty vehicles. Combining them adds to air conditions and also the two ports at San Pedro, so that is Los Angeles and Long Beach, that makes up the fifth largest cargo gateway in the world, so a lot of the economy that is driven in Southern California and, indeed, the state, is driven by goods moving through the two ports at Los Angeles and Long Beach. But that also provides an air pollution challenge that we suffer every day in the South Coast Basin. And a testament of that is the American Lung Association every year puts out a State of the Air Report indicating the most polluted cities across the nation and historically Los Angeles and our region is at the top of those lists, so this year is no different, we were number one in ozone pollution, in the top five for year-round short term particle pollution, and year-round particle pollution, so that is PM2.5 And the effects of that particle pollution are severe health effects. What I would like to point out in terms of ozone is that the Inland

Empire is the one that suffers the most because of the transport and the forming of that secondary pollutant in the atmosphere, it is photochemical oxidant. You can see this is a particularly bad day in the summertime of last year, we anticipate we are going to see similar episodes like this, this year, you notice that dark maroon color is very unhealthy for all residents in that region. And so, what is remarkable about this ozone isopleths is that almost all of the region, South Coast, is in the yellow or orange color, so that is moderate or USG, USG means Unhealthy for Sensitive Groups. And Sensitive Groups are those with developing or challenged cardiopulmonary systems such as our children and the elderly, so that is a call of great concern to the South Coast because this is indeed a health effects driven phenomenon with these point sources throughout the region. And if you look at the particulate emissions, we have estimated cancer risk associated with having heavy duty diesel and other air toxics in the region, and you can see the dark purple color essentially outlines the entirety of the freeway system throughout the South Coast, so you notice the ozone isopleths were in the Inland Empire out here, but you notice here you have got particulate emissions, and estimated cancer risk right here at the Ports of L.A. and Long Beach, and you can even see this trail of the marine vessels coming into those ports, offshore.

So, because of that, it is a great need, the voters approved in 2006 what is known as Proposition 1B, that was a bond mechanism that allowed the state to address a Good Movement emissions problem throughout the region. The state was divided into four major trade corridors, the South Coast Basin being one of those, and $1 billion is offered over a four-year period to try to mitigate those effects. The South Coast AQMD, in collaboration with the California Air Resources Board, and the Ports of Los Angeles and Long Beach had been administering a program to replace heavy duty diesel drainage trucks at the ports. So, when we applied to the CEC for assistance in co-funding, our intent was to place drainage trucks – those are these trucks which have a subscribed number of trips into and out of the ports, and they go through the gates, collect the containers, and then move out into the region. That was part of the regulation taken effect in January 1 of 2010.

Now, Ms. Allen described in great detail the hectic nature of applying and trying to secure some of this ARRA funding, and the need was extremely great in our case because we are up against this regulatory deadline of January 1, 2010, to replace these trucks, so we partnered with the ports and, also, we did secure some federal funding, we also had some EPA Diesel Emission Reduction Act funding, where we replaced 1,300 drainage trucks in a short

amount of time, 850 were diesel, but you can see that 453 were natural gas drainage trucks. And that was to support an additional funding by, as I mentioned, the Department of Energy, the EPA, as well as the Ports of Long Beach and Los Angeles. Because that funding has already been accomplished, there is another phase to the Proposition 1B program where we are going to apply the CEC funding. But, what I wanted to highlight here is the benefits that we see for natural gas now in the trucks that are being deployed, that is 80 percent reduction in NO_x emissions and, also, depending on the duty cycle, you get 20-30 percent reduction in greenhouse gas emissions, and also with the Air Resources Board's estimates for using biomethane, and I know that the AB 118 investment community has been looking at the application and implementation of biomethane, you can actually achieve close to a 90 percent reduction in greenhouse gases if that biomethane is used in these types of applications. But not only do you get criteria pollutant emission benefits, greenhouse gas emission benefits, we also get energy security in terms of petroleum reduction. And then, on top of that, we believe it is imperative to keep the technologies advancing to develop the technologies and balance the plant, fuel delivery, energy storage, fueling tanks that go hand in hand with gaseous fuels, and now it is going to help us with hydrogen, or hydrogen blends for

natural gas.

In the second phase of Proposition 1B, where we intend to utilize the entirety of the CEC co-funding, is for replacement of Goods Movement Trucks. Now, these are trucks that do not have a prescribed number of visits to the port, but they do – they haul containers into and out of the ports, and throughout the region in the South Coast area. It was a very large award made by the AQMD Board, just this past June, where we are replacing 480 trucks. We also have a back list of a thousand trucks, but of the 480 that were approved, 350 are diesel trucks, but 130-135 are natural gas trucks. Now, the CEC cost share and co-funding will be applied to those trucks to provide an incentive of $100,000 per truck, and you will be leveraging funding not only from the DOE and their ARRA grant, but also the EPA, and that is through their Diesel Emission Reduction Act.

I just wanted to point out that there is a long history, a rich history, of collaboration with the South Coast AQMD and the California Energy Commission, this is just a list of some of the most recent projects that we have worked hand in hand together on, the Cummins Westport HPDI engine is a natural gas heavy-duty engine, which you co-sponsored through your PIER Program; you have also helped develop hydrogen stations with us in our Five Cities Program. We are also the proud recipients of two of the

projects that Ms. Allen listed on her ARRA cost share, one was for transportation electrification plug-in hybrid electric utility trucks, that is a large fleet of utility trucks that would be implemented throughout the nation, and the CEC is helping us co-fund that. Also, we are recipients of CEC funding for natural gas fueling stations throughout the region. I know that SANBAG will be talking about the Ryder Truck Program, and we have been helping with the ICTF [sic], which is Interstate Clean Truck Corridor. So very pleased to be continuing our work with the California Energy Commission.

And then finally, I just want to point out, as I had mentioned at the beginning of my presentation, that this is a continuing demonstration of a accessible partnership where we established a local need, especially in environmental justice communities, we are a regional champion for applying clean technologies; but we are also leveraging federal funding not only from the Department of Energy, but from the EPA and it makes a nice fit to finally have state funding to go along with that in the form of Energy Commission funding.

Finally, I would like to add that there is an existing need in terms of health effects, as I pointed out, and I hope it would clearly make a case that, in the South Coast Region, we have a high population, and it is also exposed to very high criteria pollutants, we have an

existing demand, we are over-subscribed with respect to the number of trucks and infrastructure that can be deployed, and certainly more funding in that regard could certainly help with that. I might also point out that our governing board just recently passed a fleet rule that is requiring the phase-in of natural gas refuse haulers, and so, again, natural gas refueling infrastructure through our region will be required, and we look to the continued partnership with the Energy Commission. So with that, that concludes my presentation. I would be happy to entertain your questions.

CHAIRMAN DOUGLAS: Well, thank you. And I have got one question. How much would you say that the ARRA grant has helped you in advancing your plans for replacing trucks in South Coast? Did it accelerate your plans by months? By years? How big a step forward is this for the industry?

DR. MIYASATO: I think what the ARRA grant has done is essentially doubled, if not tripled, the number of vehicles that could be deployed at a single time. Certainly with the CEC funding, as well, also, did it accelerate the deployment of clean air? Yes. Did it accelerate the deployment of cleaner greenhouse gas emission trucks? Yes. Did it provide greater petroleum reductions? Absolutely. So, in all three counts, we would say that was a big win. But, also, in terms of showing you these partnerships between the regional government, the AQMD, the State

Government, CEC, and then the Federal Government, I think everyone mentioned how it is very important to have these partnerships as you go forward and seek additional funding, so I think it has been extremely important to be able to do that in a large manner, and I know that Michelle Kirkhoff is going to talk about how these Ryder trucks are also helping in that regard. I think it is also important to note that, when you are replacing these trucks, especially ones that are subject to a regulation, you are preserving a job. That trucker would not have his livelihood if that truck was not provided because there was a regulation that said "no more dirty trucks." So we see this as a win, as well, for the economy in terms of keeping these drivers on the road.

CHAIRMAN DOUGLAS: Well, thank you. And I was impressed to see that South Coast AQMD was also aggressive in seeking out funding from various ARRA solicitations and we at the Energy Commission were very pleased to see that, and it is always great to have California entities stepping up and putting in the work to try to bring funding to these important goals in California. Commissioners, other questions? Commissioner Eggert.

COMMISSIONER EGGERT: Sure. Thank you very much, Mr. Miyasato. I greatly appreciate you coming here. We have known each other for, I think, almost a decade now, and I know the South Coast is a tremendous champion of these

technologies for, certainly, as long as I have known him, and I know a lot of it is due to your leadership there, so appreciate that. Also, I want to thank you for reminding us that air quality is still a problem, particularly in California, despite all the improvements and advancements in vehicle technology. The fact that we still have episodes that result in very unhealthy or hazardous conditions for all citizens is really, I think, it cannot be overstated. So, I guess my question is in relation to these projects and activities, how can we move even quicker, aside from more money, which is always a welcome thing, are there other things that we could be doing to help accelerate these technologies into the marketplace?

DR. MIYASATO: That is an excellent question and I think one thing that I probably did not touch on, which I think bears me providing it in response is that, what you are doing in PIER, the Public Interest Energy Research in the development of heavy-duty natural gas engines, that type of technology, or even the Center of Excellence, that AB 118 is going to provide with heavy-duty trucks, those types of activity are extremely important to advance technologies, not only for the cleanest technologies available today, say, with heavy-duty natural gas engines, but then going to hybridization, hydraulic hybrids, something that pushes the envelope even further to reduce petroleum, greenhouse gases,

and criteria pollutants. So, those types of activities, this portfolio approach that I know that the Energy Commission subscribes to, as well as the AQMD, is having that portfolio of different activities which bear from different times, but are necessary such that we have answers in place, online, in queue, within five to 10 years. And that type of activity is something that is extremely important and we applaud your leadership there and hope to work with you on all those fronts.

COMMISSIONER EGGERT: Excellent, thank you.

COMMISSIONER BYRON: Dr. Miyasato, thank you for this vote of confidence in Public Interest Research. You have a very difficult problem you are trying to solve down in Southern California and it is interesting that ARRA funds are being applied not just creating jobs here, but trying to affect human health.

DR. MIYASATO: It is all about the health.

COMMISSIONER BYRON: Yes. But does this move the needle for you? Does this project, as big as it is, does it make much of a difference in those isopleths that you were showing earlier?

DR. MIYASATO: Absolutely, because a lot of the emissions are coming when the trucks are idling, for example, at the gate, at the ports. And so, not only are the folks that are around in the residences affected, but,

in fact, the drivers are affected, the dock workers are affected. And so, when you look at it in that respect, you are affecting lives very directly by replacing these types of older diesel trucks with cleaner even diesel trucks, but also natural gas engines, and so, in terms of moving the needle? Absolutely.

CHAIRMAN DOUGLAS: Good.

COMMISSIONER BYRON: Well, again, thank you for being here. Thank you for your presentation, and I am really satisfied to see that this is just more than creating jobs, that there are other great advantages to this – if you will accept my term – "moving the needle" here with these ARRA funds, obviously affecting human health.

DR. MIYASATO: Absolutely, it is my pleasure.

COMMISSIONER BYRON: Thank you, doctor.

MS. KOROSEC: All right, next we are going to hear from Mr. Richard Lowenthal from Coulomb.

MR. LOWENTHAL: I am not Ray, but Ray did such a good job, I will be very brief. So, Commissioners, thank you very much for having me, and Madam Chair, thank you for having me here today. I appreciate getting a chance to address you. And I certainly appreciate your help in rolling out an exciting program for us. So, our program has a lot of similarities to the EV project that you heard about earlier as part of the electrification of transportation,

ARRA segment, and, well, we could not do it without you. Next slide. Okay, so it is under the FOA28 ARRA solicitation, our project size nationwide is $37 million, $15 million from the Department of Energy, which is Stimulus money, $3.4 million from the California Energy Commission, which we appreciate very much. The project size in California is $12 million of the $37 million, and I will explain why there is different accounting in front of you than the $12, but it basically gave more than three times leverage of the California Energy Commission money, in terms of bringing jobs and infrastructure to California.

Our company is a California company, we were founded here in 2007, we are in Silicon Valley. Our manufacturing is all in California, so there is a lot of great side effects to helping us grow our business here. In our project, we will be bringing a little over 1,500 Level 2 Charging Stations to California, and 650 to people's homes, 850 to commercial spaces, at no cost to the property owners. The installation costs covered for normal installations with -- basically the money from the California Energy Commission is going to be used to pay for installation.

We have three focused regions in California, Sacramento, the San Francisco Bay Area, and the LA Basin, and we are working with three automaker partners, those are Ford, Chevy, and Daimler Benz. It is a 19-month program,

ends December 31st, and Commissioner Byron kicked it off for us last week in Palo Alto at EPRI, where we installed our first station in California. The stations look like this, outside, a shared station looks like the one on the left, we have been deploying those, we have over 130 customers, we deploy those around the world. Our first customer was the City of San Jose, our second customer was the City of San Francisco, so these stations are familiar in California, but, of course, there will be a lot more of them due to this project. The station on the right is a new product for us, that we essentially did for this grant, this is a home charger, so for the first roughly 650 people who buy Chevy Volts or Smart, or Ford Transit Connects, or focuses here in California, they will get free charging stations to go home with the car.

Our company is a little bit different than other ones in this space, in that we are very software oriented, so we have a lot of tools here for measuring how the vehicles are used, where they are charged, how much they are charged, where people drive. We also interact with the utilities, we have software interfaces with the utilities so that they can do Smart Grid management, they can do demand response and pricing within our stations, and we can pass that on to our users. We have fleet management capabilities for people who are running electric vehicle fleets, so they

will know which cars are ready to dispatch and when, so a lot of software tools. Most of my engineers are software folks, so although we are known for our hardware and we are very happy to say one of those charging stations is now in the Smithsonian, and I am prouder to say I did the voice-over, but we are really a business software company, so we do building systems, for instance, for these stations, we do asset management tools for the utilities, and we do Smart Grid integration for the utilities, as well. We have features, like you can take your e-phone, put in an address of where you are going to go next, and it will navigate you to the closest station to that address that is not currently in use, so those are some of the things you get from our software system.

The partners in this are Ford, Chevy, and Daimler Benz through Smart USA. Ford will start with the Transit Connect, we are starting to deploy those now. The Focus comes out next year in 2011. And home installations will basically be, if you order one of these cars, you will get a free station with it.

The vehicles, you can see where the vehicles are going, we are doing this in coordination with the vehicle manufacturers, not just because we are good guys, but because DOE insisted on it, because they wanted us to put infrastructure where it would be used, and we could measure

how it would be used. And I understand how people use infrastructure, where they need it, and how much these use it. We have the split in our total program of 2,000 home stations, 2,600 public stations, that is in order to see how people, how much they charge at home and how much they charge at work, and we will be reporting all of that back to you.

Program objectives, you know, we want to get infrastructure out there, so people in California can buy cars. It is an issue in parts of California. In San Francisco, over half the cars park curbside at night, so we have to put out some public infrastructure or you can never buy your Chevy Volt in San Francisco. San Francisco has six times as many cars as garages. There is an ordinance in the City that says you cannot build more than one garage per housing unit, so as a result, they have a lot of – it is difficult to park. But the home garage is not going to work, and our product was designed for that situation where you have the multiple dwelling unit apartment or condominium, or curbside parking, and our stations that are in California now, in San Francisco now, are all curbside and by City Hall.

So, we want to roll out a lot of infrastructure to help get this movement to EV started and we think California will naturally be the early adopter state; fortunately, so

do the automakers, so they will be here selling a lot of EVs. We want this to be very visible, so that is why there is a big public component here, in order to reassure drivers that California is an EV-friendly state, and that you can buy a vehicle here without being concerned about fueling. You know, I drive a BMW mini-electric vehicle, the Cooper electric vehicle, as my commuter, but I cannot go to San Francisco unless there is a charging station there, so I can charge it up and get home for dinner, so we want people in California to feel comfortable with EVs and so there will be an adequate infrastructure out there, so you will not get that evil thing called "range anxiety."

So, we are working with the other stakeholders, of course, the utilities, we have been working for the utilities for years and the three automakers to see that this goes well, and we will be collecting a lot of data and reporting it to the DOE. From the DOE's viewpoint, this is a data collection project to see how the big deployment across the United States goes. And as you have heard earlier, there is expected to be a million vehicles in the United States by 2015, and that is a lot more than we are talking about here today, so we want to be ready.

And, of course, to a large degree, this is funded by Stimulus funding money, it creates jobs, every time we ship a station, three people go to work for a day, one to build

it, and two to install it. Directly, this program will bring 100 jobs to California, but indirectly a lot more because the automakers believe that, with public infrastructure, they will sell twice as many cars, that is one aspect, the other aspect is our company is growing like wildfire, thanks to help like this, you know, we started only in 2007, we did a million dollars in revenue last year, we will do $9 this year. This is a big program for us. We are very excited about it, but we feel very confident that we will be able to execute it well.

A little bit about our status. The DOE program has been awarded and we did get through – the contract is done and we have begun to receive funding from the DOE. The Energy Commission Program was awarded and you voted on June 23rd, we thank you for that, and we announced that award last week at EPRI, at the installation of one of our charging stations. We are already installing in most of the cities, we would like to do more here, and we will talk a little bit about that issue there, and until we start to put out the public stations, the private stations go with the vehicles, and the vehicles are not being delivered yet. So, as those vehicles come out, the home stations will be installed. We are busy taking requests for free public stations, so anybody in the San Francisco, LA, or Sacramento Area who wants a public station can go on our website, they can

request one, and get in line and we will come out and install it, and we are ready to do it now. And we will do a formal kick-off of our program in the San Francisco Bay Area, a Plug-In 2010 show July 29th. Thank you. The issue I wanted to bring up is just, the best way to help would be to give us the money because you are the ones that pay for the installation, and so the California deployment, we will wait for you, and you do not like us to reimburse ourselves, you do not like us to lend you money by spending it first and getting reimbursed, so we would appreciate getting through the award stage and getting a little more package so that we can get on with doing California in a big way. Some of our customers will self-install and pay for it themselves, and so we will make progress there, but of course, we would like to get through the normal process here with the Energy Commission. Anybody have any questions?

COMMISSIONER BYRON: Mr. Lowenthal, it is good to meet you. I have heard that you want the money faster. This is not a VC firm, you know, we actually give it out faster than VC firms.

MR. LOWENTHAL: Yeah, I am sure of that. I have got plenty of experience there.

COMMISSIONER BYRON: I am just kidding. I really enjoyed the opportunity to be there at the dedication and kick this off last week, and meeting your co-founder, Mr.

Mandal, and I am really intrigued with the notion that you picked up, that you really are a software company.

MR. LOWENTHAL: We are.

COMMISSIONER BYRON: And I got that, as well, from your product information available. In fact, I coined a phrase, "this is really an information kiosk that dispenses electricity."

MR. LOWENTHAL: It is.

COMMISSIONER BYRON: And Mr. Mandal seemed to like that, as well, so that is a freebie, we are giving that one away.

MR. LOWENTHAL: He is a software guy, so he really likes that.

COMMISSIONER BYRON: If I were to take my car and charge it up at an Ecotality charger, and then over to drive up to one of yours, would I have any problems?

MR. LOWENTHAL: No. We are sharing our – there is an authentication method for the public stations, so you have to prove that you are an authorized user, it is a matter of safety and then, ultimately, some organizations will want the drivers to pay for using the stations.

COMMISSIONER BYRON: Of course.

MR. LOWENTHAL: So we have offered this up to our competitors, including Ecotality, including companies like Better Place, so that we all have a standard authentication

method. Worst case, there is a phone number on all of our stations, you can call up and you can operate it with your phone. So, if you have a cell phone, you can operate a station even if you do not have any authentication method. So, we are all very interested in not having any clubbing here – no clubs. Everybody gets to use everything, and it is a requirement of our stations that everybody can use everything.

COMMISSIONER BYRON: So, I was thinking about the technical interchangeability, but you are thinking about the billing interchangeability, again, an information company, that is good.

MR. LOWENTHAL: Information, people need to be authenticated. This is one thing we learned in the City of San Francisco. San Francisco was deployed in January of 2009, and for them, there was a big safety issue because they did not want live electricity out in the streets, we do some level one charging out in the streets there for their plug-in Prius, and so they do not want people to be able to use this for other purposes – we are talking about electric blankets, or whatever, on the streets of San Francisco, and so they wanted an authentication mechanism as a safety measure, but they also want it, for example, with level 1, the cable goes with the car in level 1, you can carry it around in your trunk; with level 2, which is 220 volt

charging, it is attached to the station, so no problem; but, when you are carrying it around with you in your trunk, the cable, for instance, on a Testarossa costs $3,000. So, we lock it in place during the charging process because you are gone for a couple hours, and you can only retrieve it if you are the person who put it there in the first place, so there are a lot of reasons to have authentication, and that is the reason we share this information with our competition.

COMMISSIONER BYRON: So, in most cases with public installations, is someone giving the electricity away? Or is it being billed back to the recipient?

MR. LOWENTHAL: So, historically, it was free, part of it, that is what happened in the CARB exercise with zero emission vehicles, is I drove back – I was in Cupertino then, I drove the Toyota Rav4 because it was a perk of office when we used to have perks, but the car was free, the charging station was free, electricity was free, everything was wonderful. But then, you know, CARB ended their ruling and in 2002 they reversed and the cars all went away. We do not want that to happen again, and we think a key ingredient to that is to have a system here, a capital system where the driver pays for the value. We saw that import even with our first customer, the City of San Jose, where they thought it would potentially be, and probably be, a gift of public funds if they charged people's cars. They charged the lucky

Tesla drivers' car by making the other taxpayers pay for it, so they actually do want to allocate costs to drivers, and in condominiums and apartments, it is even more important because the other tenants do not want to pay for that one driver, the lucky Tesla guy with this $110,000 vehicle. So, yes, there is a going to be an allocation of cost to drivers, and ultimately that is how we are going to pay for electricity and the capital and maintenance. We do not take that money, so the owners of our stations set pricing, and so if they want it free, they can make it free. You know, we sell it now to Apple and Netflix and Pixar and Dell for workplace charging, they all have kind of the same policy, which is their employees do not pay, but visitors pay, so we can split that, too, depending on which car drives up.

COMMISSIONER BYRON: Well, but we want to get away from this notion that electricity is free, also.

MR. LOWENTHAL: It is not.

COMMISSIONER BYRON: Yes, it is not free, and even when companies give it away, that does not help necessarily, but that is another issue. Let me just ask a couple quick questions because I think my fellow Commissioners may have some, as well.

MR. LOWENTHAL: Sure.

COMMISSIONER BYRON: This has not come up during last week's dedication and you probably do not know this,

but right next to where we dedicated this charger was an old charging station, and it had been there about 15 years ago. It was not maintained. How are these charging systems maintained going forward? Who pays for that?

MR. LOWENTHAL: That is very good. So, that is part of this cost, and so what we charge, it really comes out of the driver, for when the driver wants to pay. If the driver does not pay, then the station owner is subsidizing it, and we require the station owner, then, to pay for maintenance. So, one way or another, it has to be paid. We are very happy to bill the drivers and hand that money over to the station owner, but otherwise the station owner is responsible. We have a service because our stations are all networked, we have a service that we charge the owner of the station $12.00 a month, and we completely take care of the station and the driver, too, so there is a toll-free number on every station, so if the driver has any trouble, they call that number, we have 24/7 service, at our operation centers we have in Texas, London, and Hong Kong, so you can always find one of us somewhere, and we completely take care of that if the owner of the station wants to pay us $12.00 a month, and we take care of the drivers for life. In the cases of workplace charging, like with Apple, Netflix, Pixar, and the rest, that is very important to them because they do not want a disgruntled or troubled driver walking

into a receptionist and saying, "My car – how do I charge my car?" We take care of those drivers for life.

COMMISSIONER BYRON: Good. You thought of a lot of things. Just one last question and this one I have asked before, really. Obviously, you are a private sector company and you have indicated that this has been very helpful to your company, where would your company be if you did not have this ARRA funding at this point?

MR. LOWENTHAL: So it would be a very difficult time, actually, because what has happened is, because there are some grants that normal commercial businesses dried up, and as much as we like these grants, we see them as a way to get started, but we are anxious to get on with the normal commercial life. But, if you do not have one, and somebody else has one, or whatever, there is free infrastructure, that is a real problem, right? Because you cannot compete, and it would kill us. It would kill us to have some part subsidy, so we do not want to have that. But, really, for us what it has done is it has allowed us to scale up and make things cheaper, so, for instance, this home station is less than half the price of any station we have ever made in the past, and we designed the stations specifically for this program. So the best benefit of, I think, this subsidized funding, either from the federal government or the state government, is to help us get done the cost curve quickly,

so everybody can buy an EV that is affordable, and they are competitive with the gas cars. So that is what we like about it. We think it enables the industry. For us, it is a huge growth thing for our little company, but we more see it as enabling a big future by getting us down the cost curve, because otherwise the batteries in the cars are too expensive, and infrastructure is too expensive, and so we look at it as skipping a stage of the existence of this business where the volume would be low and the cost would be too high.

COMMISSIONER EGGERT: Actually, thanks for coming and good to see you again. That plays into my question. At the end of this program, or at the end of the funding, how do you sufficiently come down to a cost curve on the infrastructure side that you could be sustainable in a commercial sense?

MR. LOWENTHAL: Yeah, we absolutely think so, we absolutely believe that we are going to be profitable by the middle of next year, which is pretty good for a young start-up, and so we will be at the end of this program and turn profitable in that timeframe. So, you know, it depends on the take-off the vehicles. Ultimately, the size of this business depends on if, as they say, the dogs lead the dog food. The automakers are putting these vehicles out, they have wonderful properties, the wonderful properties of

electrified transportation, but people have to buy them to make our industry go well. And we will see. They have not really told us yet. The early indications are good. These cars sell out and people take advanced orders, and Tesla just went public and all that. So, the early indications are good, but the industry needs to grow through capitalism and, you know, if Honda sells a million cars in 2015, if that is right, we are in great shape.

COMMISSIONER EGGERT: So, at the beginning of the session today, I do not know if you were here, but somebody asked the question about the significance of AB 32, and I know this is a topic that came up at the summit, I do not know if you have any thoughts or comments on that in terms of –

MR. LOWENTHAL: Yeah, so I am crazy about AB 32 and I resent people – I resent people who say it hurts jobs because my jobs are created by when you come up with an issue or a problem like, we need cleaner air, we need to get off oil, or the Gulf is a mess, that is – Silicon Valley eats that stuff for breakfast, you give us a problem like clean up the air, or get off of oil, and it creates tons of jobs, and it created my company, right? And my company, you know, two years ago, we had two little boys, today we have 64, by the end of the year we will have 84, and by this time next year, we will have 230. It is creating jobs, I

guarantee it, so it is disingenuous of people to say AB 32 hurts jobs, it creates job. And frankly, this program would not exist without it either, and I have testified at the Senate in D.C. about this, I have testified at the House in D.C. about this, and I will testify every time because it is just not true. And it is being turned into a political football and in a way that just simply is not true because it creates jobs.

COMMISSIONER EGGERT: Thank you.

CHAIRMAN DOUGLAS: Thank you. Thanks for being here.

MR. LOWENTHAL: Thank you.

MS. KOROSEC: All right, I think we are going to skip our scheduled breaks, these were close to the end of the day anyway, and just try to power through if that is all right with everybody. So, next we are going to be talking to Michael Sinkula – am I pronouncing that correctly?

MR. SINKULA: Yeah. Just a moment while we load up, we had an error with the presentation.

COMMISSIONER BYRON: Maybe I should take that break.

MS. KOROSEC: I would hate to that because I think this will only take a couple of minutes. Well, would it be okay if we then skip to the last presentation while we are trying to locate this one? Okay, let's go ahead and proceed with SANBAG.

MS. KIRKHOFF: Good late afternoon. I am Michelle Kirkhoff from the San Bernardino Associated Governments, and I really appreciate your attention. And I talk very fast, so, if I go too fast, just say, "Michelle, slow down," and I am happy to do that. I am very pleased today to talk about our project with Ryder Truck Rental, Inc., which we think is going to be the largest single deployment of natural gas vehicles in the country when we are all said and done.

Just very quickly about the project, what it entails is it is the first natural gas truck deployment project in a commercial truck rental and leasing operation. We received $19.3 million in a combination of state and federal funding, and that funding, along with the funding that Ryder is going to be providing, will help to convert 202 heavy-duty trucks over to natural gas. We are going to be purchasing new trucks, we are not converting. But we are going to be introducing into the fleet 202 heavy-duty natural gas trucks. We are going to be constructing two public access liquefied natural gas, as well as compressed natural gas, fueling stations. We are going to be upgrading three other maintenance facilities so that they can accommodate natural gas vehicle repair. We are also going to be doing personnel, as well as customer training. The project also includes project management administration, as well as public relations and marketing. So, this is a very all

encompassing project when it is all said and done.

About my agency, we are the Council of Governments, as well as the Transportation Planning Agency for two million residents of San Diego County. If you have never been in our lovely county, it is actually the largest county in the country. We go all the way up to Nevada, Arizona, as well as we border Kern, Los Angeles, Orange, Riverside Counties. We do planning for the entire county. We also build freeways in conjunction with Caltrans and we can do a lot of this because we administer a half cent sales tax called Measure I, that was approved by the voters in 1989, and then we had another 30-year extension of that sales tax in 2004.

Ryder Trucks? They are an amazing company. We have been working with them for the last six months. They provide leading edge transportation logistics and a supply chain, Management Solutions Worldwide. What is so interesting about Ryder, in Southern California alone, they have over 1,200 customers, and that includes 6,500 trucks in Southern California. And I know most folks think of Ryder as, you know, short term rental, but they actually have very long term relationships with large corporations such as LA Times, Toyota, Mazda, where they provide turnkey services to those companies with their trucking services, where they maintain, they also sometimes provide a driver, they provide

the fueling, but on the truck it says "LA Times." They also offer other shorter term rentals, or longer term leases like five to seven years, so they have a whole variety of heavy-duty truck renting in the Southern California Area, so they were just a prime partner for this type of a project. And this is a beautiful quote from their President, Tony – I believe it is Tegnelia - who said, "As an industry leader for almost 80 years, Ryder remains committed to leveraging its expertise and the latest technologies to deliver world-class transportation products and services that build long term value for our customers." I cannot even begin to tell you their support all through the top levels of the management for this project, we are very very pleased to have them as a partner.

As I said earlier, we are receiving $9.3 million from the Energy Commission, almost $10 million from the Department of Energy through their ARRA funding, and then Ryder is contributing $17 million, so this is a $36 million project when it is all said and done.

Lots of benefits to this project, and as Matt had said earlier, in Southern California, we have a huge air quality issue, and if you looked at the map in San Bernardino County, yeah, we were that dark area on that map, but where a lot of the toxic as well as the cancer risks are posted in Southern California. So, the diesel displacement

in this project is huge, being able to domestically produce low carbon LNG, we are looking at over 400 jobs that are created, lots of greenhouse gas emissions, NO_x reductions, and, again, particulate matter eliminated. So, tons and tons of benefits as a result of this project. We are going to be purchasing CNG straight trucks to replace some of the Ryder fleet, as well as LNG and CNG tractors.

The three maintenance facilities that are going to be upgraded are located – there is going to be one in San Bernardino County in Rancho Cucamonga, there is one in LA County just south of Compton, and then one in Orange County in the City of Orange, so that is the three locations that their maintenance facilities are going to be upgraded. And then, the two fueling stations are going to be located in Orange and in San Bernardino and Rancho Cucamonga. Because in the Compton area there is existing LNG near the ports, we did not feel that we needed to build a fueling station in that area for this project.

This project is part of the Interstate Clean Transportation Corridor, Matt mentioned that also, earlier, the ICTC. At SANBAG for 15 years, we have been working with Gladstein, Neandross and Associates to help to implement fueling stations, "build it and they will come" once you get the fueling stations going, and then you can work with the trucking companies to convert over to LNG or CNG. And if

you are not familiar with the ICTC, go take a look on the Internet, they have done great work. We have worked with them for a long time. I know the CEC has worked with them before, and we are very pleased that GNA is a partner, as well, in this project.

Here are just some schematics of the Orange LNG-CNG station, what it is going to look like when it is all said and done, and constructed. And here are some examples of the Barstow LNG station, I was involved with that station construction, that is on the I-15 on the way to Vegas, worked with GNA on that project, and also used Federal funds for that project, Congestion Mitigation Air Quality Funding through the FHWA, and also the Tulare Station, GNA worked with as well, to help construct that station. So, as a team, we have lots of experience to bring this project to fruition.

The training side of this is critical, you know, to have the maintenance, the mechanics, the drivers, everybody trained so they are familiar, so that this project can be a success. And this is going to also be led by GNA, along with Ryder when we actually get the project up and running. The project management, GNA, is very involved in that, as well as I am, at my company, SANBAG, everything from planning to NEPA and CEQA clearances, the RFPs, the oversight of the construction, outreach and marketing, you

name it, we are doing it all. Marketing and outreach, because this was part of the Clean Cities procurement through the Department of Energy, we had to have a Clean Cities entity be a partner, and in Southern California, that is the Southern California Association of Governments, the Metropolitan Planning Organization, SCAG. And so they are going to be working a lot with their member jurisdictions, doing presentations at conferences, really getting the word out that, hey, natural gas converted in a large fleet, it can be successful, look at all the great work that we are doing. So, SCAG is going to be working with us very closely on this project, as well.

Timing – the funny thing, we actually executed our agreement with the Department of Energy back in January. For whatever reason, they were really excited to get our agreement executed, so that has been executed. We are in the process right now of working with the Energy Commission to get our agreement with you guys executed, you guys approved it on June 30th, so we are just now going through all the legal stuff. The biggest issue with this project is, because it truly is a public-private, I cannot execute an agreement with Ryder until the CEC contract is in place, and the DOE, and then I have to sit there and go, "Okay, are there any conflicting terms and conditions with both those contracts?" And then their attorneys, who never dealt with

any public funding have to go through it all, we have to go back and forth, back and forth with you guys, DOE, it has been really fun. So we are really really really hoping this can happen August 4th, early. Jennifer is my person here at CEC pushing it through on your end. So, if we can get this little puppy all approved August 4th, then we are going to release a purchase order for 70 trucks, we are going to start the RFP for the actual fueling stations, construction, as well as maintenance upgrades, we are going to get it all rolling and going. We are hoping by the late fall we can get those first 70 trucks in, start driver mechanic training, get the construction starting in the spring, get the station to open, the two stations opened, within a year. So, we are moving very aggressively and are very excited to start.

Keys to success – we have done this before, Ryder is an amazing company to work with, we are so happy to have this project partner, we communicate constantly. GNA and Ryder laugh about me being a government employee because I am there in the middle of the night, on weekends, we are working on this very very hard, and I think it is a really great team. Also, I think with Ryder's customer base in Southern California, this is going to be such a great project because they are going to be reaching out to so many different customers and giving them an opportunity to try

natural gas, where they might not have otherwise tried it. And so we really think the marketing and the outreach of this success is huge. And, also, Ryder has purchasing power, they buy a heck of a lot of trucks every month throughout the world, and so we are hoping this is going to be a very positive experience for them, that they can replicate it elsewhere. And, in fact, there was a recent call for projects in Southern California through the AB 2766 Discretionary Committee, and Ryder just got awarded another 15 vehicles for the Southern California area. So, they are moving forward, looking for other grant opportunities, as well.

And to answer some of your questions you have asked of others earlier, without the CEC and the DOE funding, Ryder would not be buying this volume of vehicles, not testing it on this large of a scale. This absolutely would not have happened. They might have, you know, dabbled with 10 vehicles here, or 10 vehicles there, but we are really hoping that, on this large of a scale, that we can demonstrate something that has not been demonstrated before. And I would be happy to answer any other questions you might have.

COMMISSIONER EGGERT: Thank you very much for coming, participating and staying until the end of the day, and providing us this great presentation. And I think you

have got an excellent team here, and glad to see SANBAG taking a leadership position. Do you know, has Ryder mentioned anything about, again, assuming sort of a success scenario in which these trucks and the infrastructure basically are successfully deployed, are they looking to expand this to the rest of their fleet?

MS. KIRKHOFF: Absolutely.

COMMISSIONER EGGERT: And along that, kind of, have they mentioned the timing associated with that decision?

MS. KIRKHOFF: They have not.

COMMISSIONER EGGERT: But they are looking at this as sort of a test?

MS. KIRKHOFF: Yes, and I absolutely think the fact that, even before contracts have been inked, they went and got some other grant funding to expand. They actually put in a grant for 50-year goals, but there was only enough for them for 15. So, they absolutely are looking at this and I know they have got in the works some projects in other states, but I cannot divulge that. But, yes.

COMMISSIONER EGGERT: And I think you had mentioned some of the challenges of dealing with Government agencies, and particularly with the public-private, and I think we can appreciate that. Yeah, I think we will look forward to – if you have any sort of further thoughts about, in the future, as we structure these solicitations and contracts, to make

that process smoother.

MS. KIRKHOFF: About a year from now, I will have some great, you know, once we get going and we actually start invoicing and reporting, you know, there may be some other words of wisdom down the road, but we are so excited to get started and actually start buying stuff.

COMMISSIONER EGGERT: Thank you. We appreciate it. Thanks.

COMMISSIONER BYRON: It is great that you are as excited as you are, and I have heard people say that working to get money out of the state is like, you know, walking an unmarked path with landmines. And I am concerned about the terms and conditions issues, it is almost as if we are set up to not make public-private partnerships work. And so, I am quite concerned about this when you say that you are going to have to match up all these different contract conditions and you are not quite there yet. Do you see the light at the end of the tunnel on this?

MS. KIRKHOFF: I am seeing the light. You know, and let me just give you a quick example.

COMMISSIONER BYRON: Please.

MS. KIRKHOFF: In your terms and conditions, you have some great language that, for some reason if the money goes away, this is how you would handle it, you would look at the expenses that were incurred to date. And, for

example, with this type of a project, it is not professional services where you stop work, you get paid up until that point. If they are in the middle of fueling station construction, they have turned dirt, and all of a sudden you say stop, or DOE says stop, it is not that easy, you know, you may have equipment on order, you may have to do some work to bring the project to closure. And so, it is not real clear in the DOE contract what would DOE reimburse you. And in your agreement, there is some great language that I would like to incorporate into their agreement, but trying to get, you know, some clarification out of the DOE, it is tough, they refer you to circulars, and it is not that clear. If it is a professional services contract, it is very clear. So, it is challenge and I am feeling very hopeful, and I hate to say that part of it is Ryder as an entity, are they willing to kind of trust this whole process? And are they okay with your language, and that is sufficient from the DOE, as well? It is tough, it is really tough. I think they are the type of a corporation, that they have got enough going on for them that they are willing to take this risk and there may be some parts of it they are still not real clear about, but they are willing to move forward. But, we should know in a few weeks.

COMMISSIONER BYRON: All right, well, managers like Ms. Allen are expert at this, and I am sure that if

[inaudible] worked out, she will, but I am still quite concerned and I suspect all three Commissioners here would be very interested in knowing if you come up against any what seem to be insurmountable problems, so we can help resolve.

MS. KIRKHOFF: Absolutely. You know, the other thing I could say, just real quick, when we applied to the Stimulus program, the Feds, it was supposed to be shovel-ready, with the private sector, I mean, this is about as shovel-ready as it can get, but then you still have to go through CEQA and NEPA and permits and, you know, RFPs, and so I am getting a lot of questions from the DOE, "Where is the money? Why haven't you spent it?" I mean, I had to fill out paperwork for the DOE for NEPA clearance on administration. I mean, seriously. So, this is just where I think everybody is learning and everybody is going through growing pains, and for Stimulus funding, I just do not think you can keep the same requirements that you would on a five-year project. Yeah, you want the money out the door, you have got to go lightly on some of these other requirements. And I am not saying ignore NEPA, but, you know, there has got to be some give and take here, and they were not set up to do that. So, you know, we are all learning, and we have a great contact on the Federal level, we are giving them feedback constantly, so we are learning and we will continue

to give you feedback.

CHAIRMAN DOUGLAS: I do not have a question, I just wanted to say I appreciate your comments and appreciate your being here. This entire day has been, I think, very helpful for the three of us Commissioners sitting here.

COMMISSIONER BYRON: Absolutely.

CHAIRMAN DOUGLAS: And hearing about your experiences on the ground. So thanks for being here.

MS. KIRKHOFF: Thanks for listening.

MS. KOROSEC: All right, now we will move on to our final presentation.

MR. SINKULA: Members of the Commission, ladies and gentlemen, thank you for having me and thank you for staying until the end, I guess. We are a young company in California and so I thought it would be good to first introduce our company and what we do. It is a good framework for what we are doing under the ARPA-E and the CEC funding. You know, we are a battery company, I guess, by nature, but we are not just making batteries and turning them out, there is a unique technology behind it that is good to share with you and introduce our company.

I am one of the co-founders of the company, myself and Sujeet Kumar founded it in 2007. We started the company with kind of the fundamental premise of creating a better battery for Electric Vehicles. We saw the industry just

kind of in the early stages and we saw companies like Tesla, or even GM, other small EV companies, using batteries that were for laptops, or batteries that were for power tools, and not really finding a battery out there on the market that was intended, really, for Electric Vehicles. We saw them also as really expensive, and we saw an opportunity, I guess, to create a battery that was both appropriate for Electric Vehicles, and it was also less expensive, so car makers can make cars that are less expensive, and then we can all buy them without government subsidies. So, we incorporated in 2007, we started in Hayward, California. We have since expanded to a new facility in Newark, California. There, we have a materials pilot plant and we do all of our materials innovation. We have business headquarters in Detroit, where a lot of our automakers are there, obviously, with Ford, GM, and Chrysler. There is also a new battery company emerging in the Detroit area, so we thought it would be good to have a presence there. We do cell phototyping in China, it is a facility that we own and operate. But I should probably back up a little bit. We make the material that goes inside the battery, we do not make batteries, per se, we make a unique material called a cathode material, it is the positive electrode in the battery, and so that is, when we talk about a materials pilot plant, that is what we do in California.

And just a little background on our financing. We have been financed by three venture capitalists thus far in 2007, Redpoint Ventures, Bay Partners, and Pangaea Ventures, all of which hold Board seats on our board. I would also like to point out that we have recently added a former CEO of General Motors to our Board, that we feel like having him on our board really kind of creates a conduit between the Silicon Valley, which is where we operate, and kind of the bureaucratic nature of Detroit and the big auto companies.

So, when we started the company, we looked at the market and many of the forecasts were very bullish on EVs really taking control. A lot of the reports like this one from Deutsche Bank saw a market surpassing $30 billion by 2020, just for batteries, alone. And just to put this in perspective, consumer electronics like laptops and cell phones are merely like $6 or $7 billion a day, so this is really a much bigger market than even cell phones and laptops are today, which is quite impressive. We also saw kind of a flaw in these projections. These projections assume that the cost of the batteries will come down significantly, so that automakers can sell them at cost that are competitive with gas card cars. And we did not see anything on the horizon that was actually going to make that happen. And in talking with a lot of the big automakers, they see the battery as the biggest cost component of these

electric vehicles and the biggest bottleneck for them to make them less expensive, I guess. Even like the Volt today is going to be, I do not know, $35,000 or $40,000, and the battery is going to be $10,000 to $15,000 of that total cost. Tesla, their battery pack is $25,000 to $30,000, of that $110,000 sticker price on their Roadster, so it is a significant portion of the cost. And, you know, you cannot depend on government subsidies, I guess, to make this whole industry happen, and you need to make this industry organic and grow economically.

So we started with the thought that the materials, the cathode and anode materials, are where you can make the most constructive improvement. You know, companies will do redesigns of the pack, or redesigns of the cell, but that is only going to make incremental improvements in the overall cost of the pack, or the cost of the battery. You have to really change the fundamental building blocks of the battery cell, and this is kind of where we started our company, was materials innovation. And our goal was to produce batteries with the highest capacity in the world, so with high capacity, you can have more energy in a battery and have less batteries to produce a given pack, I guess, which would reduce the total cost of the car. And we have since developed the lithium battery materials with the highest energy density in the world.

So, just to kind of show you, this is my only science-y graph in the whole presentation, but this is going to show you how it relates to other battery material today. Ours is the green curve there, the gray curve, which is kind of hard to see, is lithium cobalt oxide, which is what is in your cell phone or laptop, and then the red curve is what is going to be in the Chevy Volt, and to kind of calculate energy, you want to look at the area under each curve, so the area under the lithium cobalt oxide is very small, and so is the Chevy Volt material, but ours, being the green one, it is about twice as much as the lithium cobalt oxide, so we are doubling the capacity of what is in your cell phone or laptop batteries. And so, some numbers that you need, half as many batteries, I guess, to upgrade yourself on a laptop.

The other knock on high capacity batteries like your cell phone or laptop is that they do not last very long, like you charge and recharge them, and after a year they are pretty much dead. You cannot put that type of battery into a car, which the Tesla is eventually going to experience, but you want to have your car battery last five to 10 years, and for that, you need the battery that cycles, recharges and charges back and forth many many times. And that is something that we have done, so we have maintained high capacity in our batteries, and we have also been able to

cycle it very flat, and this is just 500 cycles, but most laptop batteries will begin to die after 200 or 300 cycles, and, so this is another unique feature of our batteries that we maintain that high capacity and can cycle for a long time.

And so we have put these unique cathode materials in the batteries of different cell sizes, this is 120, which would be intended for like the Chevy Volt, and since it was the highest capacity in our Chevy Volt type battery in the world, we won the R&D 100 Award for that, in conjunction with Argonne National Laboratory.

And now, to finally get to the ARPA-E/CEC funded grants. So, we have talked a lot about the cathode that we have created thus far, for the past three years, the grant with the CEC and ARPA-E is to focus more on the anode side, so cathode being the positive side, anode is the negative side, we have such a high capacity of cathode that we need a much better anode to kind of balance it out, and that is what this project is going to help produce. And the goal of this project is to produce a battery that is 400 watt hours a kilogram in the battery itself, and just to put that in perspective, the Chevy Volt battery is going to be 130 watt hours per kilogram, so this is going to be three times as high a density as the Chevy Volt battery. So, presumably, that will reduce the cost by at least two-thirds. And just

- I do not know how familiar you guys are with the ARPA-E Program, but there were 400 applicants for an ARPA-E grant - or 4,000 Applicants, sorry - for an ARPA-E grant this year, and we were one of the 37 recipients in the first round, so highly selective group, and we were very lucky to get that grant.

And just a little bit more on the cost side of things. I talked a lot about how we are going to decrease the cost, some of that, but this really shows you comprehensively of where the industry is at and where we are targeting for our current battery and for our next one with the ARPA-E grant. So, typically batteries are measured on a cost per kilowatt hour, or cost per unit of energy. The industry trend is that line decreasing, so right now in 2010, we are still well above what we consider to be the threshold for economic viability of Electric Vehicles; this is not my prediction, this is what many of the industry analysts have predicted for the threshold that the companies need to get to in terms of battery cost. Our first generation of batteries are the green dot right there, will be used in major OEMs, U.S. OEMs, plug-in hybrid electric vehicles, we have not announced which one that is, but you guys could probably guess which one. And this is why they have chosen our battery material, because it is going to reduce their total battery cost by $5,000 per car, and so it

is an extremely significant amount of money just by using our cathode material.

And then, the one that is funded through this program, which is the ARPA-E dot down there, further reduces the cost and we hope that the same automaker will be using that in their next generation plug-in hybrid electric vehicle.

And this is actually a little bit more information on that one program that we have with this major OEM. This describes kind of how we helped not only reduce the size of the battery pack, but everything that is after that, so the interconnects, the cooling system, all the safety mechanisms, the software, and all those that can be reduced, as well, so it is kind of a domino effect by using this higher energy batteries that you reduce other components of the car, as well. And just to summarize our company and where we are headed, we have a battery with the highest energy density material in the world, and that helps reduce the battery weight, the battery cost. We also have batteries that have extremely long cycle lives, so you do not need to replace it. We have a huge IP portfolio, and we are focused on the EV and PG applications. We could easily put this in the laptops and sell, but we are much more excited about the potential of the EV market. So, thank you for your time.

CHAIRMAN DOUGLAS: I will just make a brief comment and then I have actually got to run upstairs for a 4:30 meeting, but I see that both of my fellow Commissioners have written down notes of questions that they have for you. I just wanted to thank you, this is an extremely impressive presentation, it is great to see you, it is great that you have helped get your company to this point, and are in a position to make a very significant contribution to our energy needs in the transportation sector. So, thank you for being here, and I will pass this on to my fellow Commissioners.

COMMISSIONER EGGERT: Yeah, again, I will echo that, I really appreciate the presentation. I think I have seen a version of this presentation in the past. I guess, yeah, to the extent that you are able to hit those numbers, especially – well, even just the first gen value which is 250 or 300, somewhere between there, is a game changer in terms of the costs, and then your second gen would really be transformative. I guess, in the context of sort of this project – two questions – one is, are you able to share enough information to be able to make an evaluation of those costs? Because I think, in terms of policymakers, it would be really useful to have some – whether it is third-party assessment, to show that that is kind of where we are at, I assume those are high volume manufacturing estimates?

MR. SINKULA: Yeah.

COMMISSIONER EGGERT: Okay.

MR. SINKULA: Yeah, and we are a cathode maker, first of all, so the subsequent cost, I guess, to making a battery pack, we rely on the OEM and other battery makers, I guess, for estimating those costs, but for producing the cathode material, which actually is 40 percent of the cost of the cell, it is so significant, we are very in control of those costs, I guess.

COMMISSIONER EGGERT: Did the milestone points to those represent the full battery cost? Or just the system –

MR. SINKULA: Just the system cost. Full system. So, we work with this major OEM to determine how much the system costs would be using our cathode material.

COMMISSIONER EGGERT: So, I guess my next question is, given that will require scale-up, and volume manufacturing at the conclusion of this project, do you see going to high volume manufacturing, serious production?

MR. SINKULA: Yes, that is the next step for us. You know, we have a very clear roadmap with this one OEM, so we know when we need to begin building a plant that would produce certain amounts of cathode material, and we would like to have that happen in California. But we are working with DOE right now in establishing hopefully a loan program for us to do that.

COMMISSIONER EGGERT: And then, in terms of – do you see participation in any of these battery second life projects and activities, so subsequent to the use of the vehicle, bringing it into distributed energy storage applications?

MR. SINKULA: We would like to, but we are too small of a company to be focused on things outside of the immediate vehicle applications.

COMMISSIONER EGGERT: Yeah, very impressive work and appreciate your coming here.

MR. SINKULA: Absolutely.

COMMISSIONER BYRON: Mr. Sinkula, thank you very much. We saved the best for last, it seems. I mean, I would like to correct you in one regard, it was not luck, I do not think, that you won the ARPA-E Award, this is really impressive. I note that we are in for about a quarter of the funding in our match. Did that have much influence, do you think, in your winning this? Or is it primarily your technology that won this?

MR. SINKULA: Well, I think it was luck. No. We – I think – well, so this project was focused on the anode as opposed to the cathode, the ARPA-E project with the CEC, and we would not have been focused on the anode this early in our lifetime, I guess, had it not been for this program and this funding. So, we would have kept going with the cathode

and made the battery, and then maybe moved onto the anode, but this ARPA-E provides us an opportunity to focus on the anode now, as opposed to later, which is going to really push the energy that is being caused [phonetic].

COMMISSIONER BYRON: Well, I am ready to place my wager. If you could leak to me who the OEM is, I will bring it by.

MR. SINKULA: You can probably guess.

COMMISSIONER BYRON: Okay, but, you know, a $30 billion a year market opportunity here and you are, my guess, a pretty small company?

MR. SINKULA: Yeah, so we have 25 people here in California, and then we have 10 in China, and three in Detroit.

COMMISSIONER BYRON: You need less than two years, you will be bought. And that is not all bad, either. But I am really impressed with the technology and what you have done so far. I hope you have tremendous success, and this is just another great project that obviously demonstrates great potential here. This is the perfect example of why an ARRA investment in these kinds of technologies was a good thing. Don't you agree?

MR. SINKULA: Yes, absolutely. No, we appreciate it very much. Yeah, we started that program, the ARPA-E project, I guess, last January, so we have been making a lot

of progress already with the anode, and we will probably get close to our goal before the two-year allotment, I guess, for the program.

COMMISSIONER BYRON: Well, I see Commissioner Eggert wants to go at it again, too. We are both engineers that really like this, so….

COMMISSIONER EGGERT: I was just going to suggest that last one was a bit of a leading question.

COMMISSIONER BYRON: Sure, absolutely.

COMMISSIONER EGGERT: No, actually, you just reminded me with respect to, you know, some of the potential benefits of these programs, is creating these new companies that will then, you know, sell product outside of the state, and it sounds like you have already got connections back, not just to Detroit, but even outside of the country.

MR. SINKULA: Yeah, but we have been working with a lot of, well, fortunately, but unfortunately, a lot of foreign automotive companies that are also very interested.

COMMISSIONER EGGERT: In terms of, as you sort of move towards that decision of scaling up on the manufacturing side, do you have any sense of where that would occur? And we have quite a number of manufacturing sites here in California, and whether or not those will weigh on the decision of location?

MR. SINKULA: Yeah, my priority would be to keep

everything as centralized as possible via – we already have three different locations, I guess, for our small little company, and so it is already kind of a strain, I guess, to have that many facilities. And so I prefer to have it right down in Newark or in the East Bay where we are currently located, if possible. There are a lot of empty buildings there near – NUMI, too, is actually there.

COMMISSIONER EGGERT: That is right, you could share with Tesla.

COMMISSIONER BYRON: Well, thank you very much.

MR. SINKULA: Of course, thank you.

MS. KOROSEC: All right, I think we have just a few minutes left, if we have any public comments in the room. Is there anybody who would like to pass any final questions or make any comments?

MR. KRIEGER: Forgive me, you know, living in a chicken coop as long as I have, I have a chance to get out once in a while. I just really appreciate the opportunity to have been here today and meet you folks and see what you are really doing, and the difficult job that the Commission really has in energy efficiency systems. I know that the mission of the CEC is the management of the state's energy needs and resources, and I guess you might say that your vision would be to have zero emissions and total energy independence some day as a grand vision. I just have a

question insofar as adding this figure of a million vehicles plugging into the grid, perhaps half of them from California. Has the Commission considered what the impact that would have upon the grid insofar as additional energy being needed for that grid, electricity? I know that the state, in general, imports approximately 25 percent of its energy needs from the Northwest, I guess, and 10 percent in the Southwest, maybe another 15 percent. What impact that number of vehicles would have upon the system? Is there any research as to how that would impact the system, the grid?

COMMISSIONER EGGERT: Yeah, if I may, I think the answer is there is some research, including some of the research that is being conducted by some of the projects that presented earlier, looking at localized impacts, because it is both the systematic impacts and some of the local distribution impacts like our local transformers. Part of the analysis also includes looking at different charging strategies to encourage better use of the grid, so again, as was previously mentioned, the idea of scheduled charging because, you know, if you for example are charging your home, you only care that you have a full charge when you get up in the morning to go to work, that allows for some flexibility to manage that charge. I think, even with a million vehicles, if you can manage the load properly and push a majority of that to the off-peak, it actually

provides two potential benefits, it allows you to fill in the load trough, make better use of generating capital, which actually makes the system more efficient and more cost-effective, and you can, you know, once we really get these smart charging systems and Smart Grid systems in place, you can start to manage the load with intermittent renewables, again, because you have a scheduled load, the ability to take advantage of when the wind blows, as a further advantage. So, I guess the rather long answer to your question is, yes, there are a lot of studies going on. Each of the utilities has projects underway. There are a number of research institutions that are studying this. EPRI has a program that has looked at this, and it is being sliced and diced in many different ways to look at that particular question.

MR. KRIEGER: Has the Commission looked at a EV system that is a non-plug-in? Has that ever crossed the Commission's –

COMMISSIONER EGGERT: Well, we do actually also have programs looking at hydrogen electric vehicles, which are not plug-in, they are basically using on-board hydrogen to generate the electricity for electric drive, so that is one example.

MR. KRIEGER: Okay. Thank you.

COMMISSIONER BYRON: Mr. Krieger, it is fair to say

that is not the subject – I should say, this is not the purpose of the workshop, but we are very concerned about these issues that you bring up, they are very good questions. The rate at which – the time of day and the rate at which these would charge could be a serious problem for the grid, so that has to be managed, as well, and that is why it is not just an energy and a technology issue, it is also a management issue that we have to deal with. So, good questions, but we did not really delve into them in much detail in today's workshop.

MS. KOROSEC: And we are looking at that, also, as part of our demand forecasting activities at the Commission on expected electricity demand. It is going to be under different scenarios, going forward. All right, do we have anyone online, Lynette? Or should we just open the lines? Okay. All right, the lines are open on the WebEx if anyone has a question or a comment, now is the time. All right, the sounds of crickets chirping, maybe a bird. We have no one there, we have worn everyone out. All right, I think if you have any closing comments, Commissioners?

COMMISSIONER EGGERT: I will start it, I will just say that I have learned quite a bit today. This has been a great opportunity to learn about how our investments through our various programs, especially those that were successful in partnering with the Federal Government through ARRA, are

generating significant activity here within the state, that are helping to establish activity that is going to allow us to meet our energy and environmental goals, it is creating industries that are going to provide for new jobs, and economic activity that will sustain us well beyond the end of the Stimulus funds coming from the federal government, in particular, as currently scheduled. So, it was very worthwhile. I think we also heard a number of issues and concerns, areas where we might improve our processes, and perhaps reduce administrative and reporting burdens, so I am very interested in following up on those suggestions, as well. So, appreciate everybody who stayed until the final end, including those on the phone, and with that, I will turn it back over to Commissioner Byron.

COMMISSIONER BYRON: Well, thank you. I will just finish up with a couple of observations from the workshop today. First of all, I cannot thank the project presenters enough for being here, at least one was on WebEx, and presenting and sharing your projects. Obviously, they put together tremendous projects that have, for the most part, acquired their funding based upon their merits, and if we helped in any way, of course, that is just a bonus, that I think what we have discovered today, there are some excellent projects. I was struck by the contrast, though, and I am not sure if everybody would characterize it the

same way as I would, but between the first half and the second half, early on, we got all the Smart Grid presentations, which are pretty much in the context of the utility model and serving the needs of the grid, and our policy needs from the state's perspective, but we certainly picked up in the afternoon that transition to the importance of the private sector, or let's just say – yeah, that is a good way to put it, yeah, the private sector and the non-monopoly utility model. That is where the big job creation is going to take place and we need to certainly be thinking that way with regard to the Smart Grid, as well. It would be difficult to imagine what the Internet would look like today, or if it would even exist, if we did not deregulate Telecom a number of years ago. Now, I am not suggesting that we deregulate the utility industry, just that we think about the Smart Grid from the customer perspective and the opportunity for the third-party contractors to be involved in that. And that was somewhat missing. But, in the afternoon, we got that in spades. I took a number of messages from the workshop today, obviously the CEC funding or co-funding was helpful in most of the companies in winning their proposals, it is certainly also a Brave New World out there, that we have investor-owned utilities and municipals that are taking federal money, and I do not think it is new to many of them, using state money for funding

some projects. We have certainly accelerated or advanced the programs and it has advanced our understanding and knowledge base around a lot of these technologies. But, again, we are beginning to see that these projects open up new markets for private sector companies, and that is where the real growth is going to be. ARRA funds represent a significant investment in California, they provide jobs, they are helping to accelerate our energy policies, they obviously are intended and are saving customers money, but, again, the biggest growth opportunity is going to be those new markets for technologies and companies. I think this was an excellent workshop. I would like to thank staff in putting this one together, I certainly learned a lot, and I thank you all for being here. We will be adjourned.

MS. KOROSEC: Thank you.

[Adjourned at 4:51 P.M.]